

Cost Effectiveness Study for a Locally Adopted Energy Efficiency Ordinance for the City of Manhattan Beach

Prepared by:

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Prepared for:

**The City of Manhattan Beach
Department of Community Development
1400 Highland Avenue
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(310) 802-5525**

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Last Modified: **October 20, 2010**

Background

In October 2008, City Council formed a resident-based Environmental Task Force (Task Force) to study environmental issues of priority to the community. A Sustainable ("Green") Building Subcommittee was formed and developed a four-pronged approach to sustainable development for the City of Manhattan Beach. Their studies and the resulting recommendations were specifically tailored to the Manhattan Beach's environmental conditions and its largely residential makeup. Specific emphasis was placed on energy efficiency, water conservation, runoff reduction, solid waste reduction and diversion, and air quality and emissions reductions. Among the measures studied and recommended was a policy that would increase overall energy efficiency in the residential sector relative to Title 24 mandates and baselines. Utilizing the services of an energy consultant, the feasibility of this approach was studied and demonstrated to be both reasonable and cost effective.

1.0 Executive Summary

- 1.1 The City of Manhattan Beach has researched and reviewed the feasibility and cost- effectiveness of requiring all permit applicants for new residential construction and residential additions and remodels exceeding 50% valuation to exceed the performance requirements of the 2008 Building Energy Efficiency Standards by a margin of 15%.
- 1.2 Per the criteria stated in the California Code of Regulations, Title 24, Part 1, Section 10-106, Locally Adopted Energy Standards, these local standards shall require buildings to be designed to consume no more energy than permitted by Title 24, Part 6.
- 1.3 If adopted, Ordinance and the Locally Adopted Energy Efficiency Standards shall be submitted to the California Energy Commission for review and approval. The proposed Ordinance and Standards shall take effect only after the Commission has reviewed and formally approved the proposed local energy standards as meeting all requirements of Section 10-106, and the Ordinance has been filed with the Building Standards Commission.
- 1.4 The proposed local energy efficiency standards and implementation have been designed with several key criteria in mind, including;
 - 1.4.1 Consistency with the structure, format and calculation methods of the 2008 Title 24 Building Energy Efficiency Standards;
 - 1.4.2 Local Building Department review, verification enforcement and field inspection;

- 1.4.3 Provide flexibility for building permit applicants to comply with the Ordinance by the performance approach using a wide range of building and appliance energy conservation measures.

2.0 Objectives

- 2.1 It was determined that the City of Manhattan Beach shall draft and adopt a Locally Adopted Energy Standard.
- 2.2 Per the criteria stated in the California Code of Regulations, Title 24, Part 1, Section 10-106, Locally Adopted Energy Standards, this local standard shall;
 - 2.2.1 Require buildings to be designed to consume no more energy than permitted by Title 24, Part 6;
 - 2.2.2 Require all permit applicants for new residential construction and residential additions and remodels exceeding 50% valuation to exceed the performance requirements of the 2008 Building Energy Efficiency Standards by a margin of 15% (per Cal Green Tier 1).
 - 2.2.3 Be consistent with the structure, format and calculation methods of the 2008 Title 24 Building Energy Efficiency Standards;
 - 2.2.4 Be specifically tailored and drafted for ease of local building department review, verification enforcement and field inspection;
 - 2.2.5 Provide flexibility for building permit applicants to comply with the Ordinance by the performance approach using a wide range of building and appliance energy conservation measures;
 - 2.2.6 Be analyzed to the fullest extent possible for;
 - a) Cost effectiveness. lowest initial cost(s);
 - b) Feasibility;
 - c) Flexibility.

3.0 Applicability

- 3.1 The standards and ordinance shall be applicable to all permit applicants for new residential construction and residential additions and remodels exceeding 50% valuation.

3.0. Methodology:

- 3.1 The energy performance impacts of exceeding the performance requirements of the 2008 Title 24 Building Energy Efficiency Standards by a margin of 15% in Climate Zone 6 were evaluated using a range of recent permit applications in the City of Manhattan Beach as Case Study models. These projects were deemed to be representative of those building types typically constructed in Manhattan Beach.
- 3.2 The 2008 Building Energy Efficiency Standards, effective January 1, 2010, were used as the baseline in calculating the energy performance of efficiency measures summarized in this study.
- 3.3 Case Studies were based on actual project designs selected from recent permit applications (herein, "Cases").
- 3.4 To the greatest extent possible and/or practical the Cases were selected by virtue of the fact that they were typical and representative of the building types and lot configurations prevalent to Manhattan Beach.

3.5 Cases: The selected Cases are as follows;

- 3.5.1. 2-Unit Condo: New construction, 2-unit attached multi-family residential (condominium) measuring 5,202 square feet of conditioned area.
- 3.5.2. The Strand SFR: New construction, single family residence measuring 5,557 square feet of conditioned area.
- 3.5.3. East Manhattan SFR: New construction, single family residence measuring 3,137 square feet of conditioned area.
- 3.5.4. East Manhattan E + A (Existing plus Addition) SFR, single family residence measuring 2,742 square feet of conditioned area.

3.6 Base Cases:

The Base Case for each Case is the actual design as submitted including the actual Title 24 compliance documentation for the given project. Note that, in the significant majority of on-file cases, the margin of compliance ranges between 0% -3% for new construction to as high as 8% for additions and remodels.

- 3.7 Where the project data and compliance for a given Base Case pre-dated the current 2008 standards, the project was re-tested and verified for compliance with the 2008 Standards using accepted methodology and computer software modeling program(s).
- 3.8 Each Base Case design was then manipulated by incorporating various Energy Efficiency Measures. These measures were selected by virtue of the fact that they were deemed to be relatively cost effective, readily available, relatively simple to implement and effective as per the professional opinions and with the input of local Architects, Building Officials, Energy Consultants and Contractors. The proposed measures were deemed to represent a reasonable set of measures that accurately reflected how local designers, builders and developers might reasonably achieve a specified level of performance using a relatively low first incremental (additional) cost.
- 3.9 The minimally compliant Base Case designs were then modified to achieve greater levels of energy efficiency by incrementally adding various energy measures and/or combinations of measures so that each Case building exceeded the 2008 standards by 20%.
- 3.10 Initial incremental costs of added energy efficiency measures were established by a variety of research means and with the input of local Architects, Building Officials, Energy Consultants and Contractors to establish first cost data.
- 3.11 Site energy was calculated from the Title 24 simulation results to establish the annual energy savings, energy cost savings and CO₂-equivalent reductions in greenhouse gases.
- 3.12 Life Cycle Cost (LCC) studies were conducted for each the Energy Efficiency Measures of each Case.
- 3.13 Note that;
 - 3.12.1 In many instances, highly effective energy efficiency measures may carry little or no additional cost. For example, incorporation of passive design elements such as proper orientation of fenestration, overhangs and thermal mass can increase energy efficiency considerably for no increase in initial cost and reducing glazing area may actually reduce initial costs. However, it was recognized that many residential projects are designed and/or built by non-professionals. Therefore, it was determined that the proposed set of measures used in the study to achieve higher levels of energy efficiency should be such that they can be added to virtually any

conventional, design with no special knowledge of or skill in the field of passive architectural design.

3.12.2 The possible range of measures is essentially infinite and, therefore, the relative costs and complexities associated with implementing various measures will vary considerably. The design choices used in the Case studies this study are based on many years of experience with architects, builders, mechanical engineers; and general knowledge of the relative acceptance and preferences of many measures, as well as their incremental costs. This approach tends to reflect how building energy performance is typically evaluated for code compliance and how it's used to select design energy efficiency measures.

3.12.3 Lowest simple payback with respect to building site energy was not the primary focus of selecting measures; but rather the requisite reduction of Title 24 Time Dependent Valuation (TDV) energy at a reasonable incremental cost consistent with other non-monetary but important design considerations.

4.0 Analysis:

4.1 Base Cases

- 4.1.1 2-Unit Condo: New construction, 2-unit attached multi-family residential (condominium) measuring 5,202 square feet of conditioned area. Framed walls are insulated to R-19. Basement retaining walls are insulated to R-13. Two 50 gal. water heaters 0.60 EF. 470 sf floor area insulated R-30 batts. Contemporary design. 37.8% glazing to conditioned floor area.
- 4.1.2 The Strand SFR: New construction, single family residence measuring 5,557 square feet of conditioned area. Less than 12' of ducts in unconditioned space. Furnace 80% AFUE. Retaining walls in basement are insulated. West facing glazing is monolithic. Quality insulation installation & duct testing has been specified - These measures require verification by a certified HERS Rater. R-30 Floor Insulation has been specified.
- 4.1.3 East Manhattan SFR: New construction, single family residence measuring 3,137 square feet of conditioned area. No R-19 ceilings. wall fenestration U-Factor = 0.33, SHGC = 0.31. Gas furnace w/ AFUE = 92.

- 4.1.4 East Manhattan E + A (Existing plus Addition) SFR, single family residence measuring 2,742 square feet of conditioned area. Assume existing and new fenestration is double-glazed, non-metal, clear glass. Standard gas 50 gal or less water heater.

4.3 Summary of 15% Margin of Compliance Cases with ECM's Added and Respective Initial Incremental Costs

4.3.1 2-Unit Condo:

- ECM-6: Quality insulation installation, HERS Required
Initial Incremental Cost = \$675.00 (for 2 systems)
- ECM-8: Furnace upgrade - AFUE 80% to 95%
Initial Incremental Cost = \$600.00 (for 2 systems)

4.3.2 The Strand SFR:

- ECM-3 Wall Insulation Upgrade: R-13 to R-19 Batts
Initial Incremental Cost: \$150.00
- ECM-8 Furnace upgrade - AFUE 80% to 95%
Initial Incremental Cost: (2) units @ \$600.00 = \$1,200.00
- ECM-11 Low Leakage Ducts in Conditioned Space - HERS Required
Initial Incremental Cost: \$0.00
- ECM-13 Eliminate (downgrade) (3) ea. skylights
Initial Incremental Cost: (3) units @ (\$450) = (\$1,350)

4.3.3 East Manhattan SFR:

- ECM-6: Quality insulation installation, HERS Required
Initial Incremental Cost = \$150.00

ECM-11 Low Leakage Ducts in Conditioned Space - HERS Required

Initial Incremental Cost: \$350.00

4.3.4 East Manhattan E+A SFR:

ECM-5 Replace existing furnace: 80% AFUE furnace (E) w/ 95% AFUE furnace

Initial Incremental Cost: \$1,600.00

ECM-7 Skylight Upgrade (Replace w/ Velux)

Initial Incremental Cost: \$450.00

ECM-9 Attic insulation upgrade: Assumed R-19 (E) to R-30

Initial Incremental Cost: \$1,600.00

4.4 Cost Data & Energy Conserving Measure (ECM) Descriptions and Respective Initial Incremental Costs

4.4.1 ECM 1: House wrap upgrade: upgrade from 60 minute paper to Typar or Tyvek house wrap. (Note: This ECM not used)

a. Nominal 3,000 sf house = \$560.00

b. Nominal 5,550 sf house = \$950.00.

4.4.2 ECM 2: HERS Rater

a. 2-Unit Condo: \$330.00

b. The Strand SFR = \$150.00

c. East Manhattan SFR: \$500.00.

4.4.3 ECM-3: Wall insulation upgrade: upgrade wall insulation from R-13 to R-19 batts.

a. 3,000 sf house = \$80.00

b. 5,550 sf house = \$150.00

b. The Strand SFR: \$150.00

- 4.4.4 ECM-4: Tankless water heater upgrade: upgrade 75 gal. storage tank water heater 0.58 EF to Takagi or Noritz equivalent tankless (Note: This ECM not used)
- a. \$800.00 w/ no venting
 - b. \$2,100.00 w/ venting
- 4.4.5 ECM-5: Replace (E) existing 80% AFUE furnace w/ 95% AFUE furnace = \$1,600.00 per unit.
- 4.4.6 ECM-6: Quality insulation: upgrade to "quality insulation" w/ HERS verification = \$200-\$330.00 (HERS raters typically quite a package of services including duct verification, insulation verification and envelope testing).
- a. 2-unit condo = \$330.00 (2 units)
 - b. East Manhattan SFR = \$150.00
- 4.4.7 ECM-7: Skylight upgrade: replace 11 sf skylight w/ Velux = \$450.00
- 4.4.8 Furnace upgrade - 80% to 95%: dual-stage 80% AFUE to dual-stage 95% AFUE = \$600.00 per unit.
- a. 2-unit Condo = \$1,200.00 (2 units)
 - b. The Strand SFR = \$1,200.00 (2 units)
- 4.4.9. Replace/upgrade (E) attic insulation: insulate existing 1,665 sf attic w/ R-30 batt insulation = \$1,600.00
- 4.4.10 Replace (E) water heater w/ energy efficient upgrade: replace existing 50 gal. water heater w/ new 50 gal. Tank-type 0.61 EF
- a. \$2,075.00, B-vent, no-recirculation
 - b. \$2,750.00, power vent, no recirculation (Note: This ECM not used)
- 4.4.11 Low leak ducts/ducts in conditioned space: low leakage ducts in conditioned space. Requires ECM-2, HERS rater (see ECM-2).
- a. The Strand SFR = \$0.00 (duct testing is required in the base case)
 - b. East Manhattan SFR = \$350.00.

4.4.12 Upgrade std. 50 gal. storage tank water heater to 50 gal. 0.65 EF =
\$188.00 (Note: This ECM not used)

4.4.13 Skylight downgrade (elimination): eliminate three skylights @ \$450.00 ea
= net savings of \$1,350.00.

5.0 Exhibits (attached)

5.1.1 Energy Report, 2-Unit Condo, Base Case

5.1.2 Energy Report, 2-Unit Condo, 15% margin of compliance

5.1.3 Life Cycle Cost Summary, 2-Unit Condo

5.1.4 Energy Report, The Strand, Base Case

5.1.5 Energy Report, The Strand, 15% margin of compliance

5.1.6 Life Cycle Cost Summary, The Strand

5.1.7 Energy Report, East Manhattan SFR, Base Case

5.1.8 Energy Report, East Manhattan SFR, 15% margin of compliance

5.1.9 Life Cycle Cost Summary, East Manhattan SFR (20 year study period)

5.1.10 Energy Report, East Manhattan E+A SFR, Base Case

5.1.11 Energy Report, East Manhattan E+A SFR, 15% margin of compliance

5.1.12 Life Cycle Cost Summary, East Manhattan E+A SFR

6.0 Conclusions

Regardless of the specific building design, and/or occupancy profile, the incremental improvement in overall annual energy performance of buildings in exceeding the 2008 Title 24 Building Energy Efficiency Standards appears to be cost-effective. As demonstrated by the Case study Energy Reports and Life Cycle Cost Analyses, each of the four study models could be modified to achieve the targeted 15% minimum margin of compliance over their respective baselines using sets of conventional Energy Conserving Measures and each of the four

cases demonstrate payback of the initial incremental costs associated with those measures.

However, each building's overall design, occupancy type and specific design choices may allow for a large range of incremental first cost and payback. All permit applicants should carefully analyze building energy performance to reduce incremental first cost and the payback for the required additional energy efficiency measures.

It is important to acknowledge that the possible range of measures is essentially infinite and, therefore, the relative initial costs and complexities associated with implementing various measures will vary considerably. In many instances, highly effective energy efficiency measures may carry little or no additional cost. For example, incorporation of passive design elements such as proper orientation of fenestration, overhangs and thermal mass can increase energy efficiency considerably for no increase in initial cost and reducing glazing area may actually reduce initial costs. Conversely, other options such as extensive photovoltaic systems may carry high initial costs. Initial costs may also be higher when efficiency measures are not considered and integrated into the design as a whole system.

BUILDING ENERGY ANALYSIS REPORT

PROJECT:

2-Unit Condo (0.1%) BASE CASE
2208 Manhattan Avenue/2207 Bayview
Manhattan Beach, CA 90266

Project Designer:

Michael Lee Architects, Inc.
2200 Highland Avenue
Manhattan Beach, CA 90266
(310) 545-5771

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

8261R

Date:

10/13/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

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PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)		CF-1R																																																																																																	
Project Name 2-Unit Condo (0.1%) BASE CASE			Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration				Date 10/13/2010																																																																																																		
Project Address 2208 Manhattan Avenue/2207 Bayview M			California Energy Climate Zone CA Climate Zone 06		Total Cond. Floor Area 5,202		Addition n/a		# of Stories 3																																																																																																
FIELD INSPECTION ENERGY CHECKLIST <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.																																																																																																									
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PERFORMANCE CERTIFICATE: Residential (Part 2 of 5) **CF-1R**

Project Name 2-Unit Condo (0.1%) BASE CASE	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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SPECIAL FEATURES INSPECTION CHECKLIST

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

The HVAC System Carrier Corp. 310JAV024045 does not include a cooling system, field verification is not necessary.

HIGH MASS Design - Verify Thermal Mass: 630.0 ft² Covered Slab Floor, 3.500" thick at Basement

HIGH MASS Design - Verify Thermal Mass: 465 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement

The HVAC System Carrier Corp. 310JAV024045 does not include a cooling system, field verification is not necessary.

HIGH MASS Design - Verify Thermal Mass: 65 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement

HIGH MASS Design - Verify Thermal Mass: 1,028.0 ft² Covered Slab Floor, 3.500" thick at Basement

HIGH MASS Design - Verify Thermal Mass: 575 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name 2-Unit Condo (0.1%) BASE CASE	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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ANNUAL ENERGY USE SUMMARY

TDV (kBtu/ft ² -yr)	Standard	Proposed	Margin
Space Heating	20.60	20.91	-0.31
Space Cooling	0.19	0.36	-0.18
Fans	3.23	3.35	-0.12
Domestic Hot Water	15.80	15.17	0.63
Pumps	0.00	0.00	0.00
Totals	39.83	39.80	0.04
Percent Better Than Standard:			0.1 %

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

Building Front Orientation:	(S) 160 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	2.00	(S)	1,778	628
Fuel Available at Site:	Natural Gas	(W)	989	639
Raised Floor Area:	470	(N)	2,582	657
Slab on Grade Area:	1,658	(E)	510	43
Average Ceiling Height:	8.9	Roof	2,356	0
Fenestration Average U-Factor:	0.33		TOTAL:	1,967
Average SHGC:	0.31		Fenestration/CFA Ratio:	37.8 %

REMARKS

BASE CASE: Framed Walls are insulated to R-19. Basement Retaining Walls ARE insulated to R-13. Two 50 gal. W.H. 0.60 EF. 470 sf Floor has R-30 Batts.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation AuthorCompany **NEWTON ENERGY**Address **1401 19th Street**Name **Rick Newton**City/State/Zip **Manhattan Beach, CA 90266**Phone **310 375-2699****10/13/2010**

Signed

Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)Company **Michael Lee Architects, Inc.**Address **2200 Highland Avenue**Name **Michael Lee**City/State/Zip **Manhattan Beach, CA 90266**Phone **(310) 545-5771**

Signed

License #

Date

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name
2-Unit Condo (0.1%) BASE CASE

Building Type ☐ Single Family ☐ Addition Alone
☒ Multi Family ☐ Existing+ Addition/Alteration

Date
10/13/2010

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	900	0.036	R-30				0	0	New	4.2.2-A16	2nd Floor Zone
Wall	352	0.074	R-19				340	90	New	4.3.1-A5	2nd Floor Zone
Wall	214	0.074	R-19				160	90	New	4.3.1-A5	2nd Floor Zone
Wall	130	0.074	R-19				70	90	New	4.3.1-A5	2nd Floor Zone
Wall	111	0.074	R-19				250	90	New	4.3.1-A5	2nd Floor Zone
Floor	470	0.033	R-30				0	180	New	4.4.2-A15	1st Floor Zone
Roof	161	0.036	R-30				0	0	New	4.2.2-A16	1st Floor Zone
Wall	320	0.074	R-19				340	90	New	4.3.1-A5	1st Floor Zone
Wall	249	0.074	R-19				160	90	New	4.3.1-A5	1st Floor Zone
Wall	87	0.074	R-19				70	90	New	4.3.1-A5	1st Floor Zone
Wall	130	0.074	R-19				250	90	New	4.3.1-A5	1st Floor Zone
Slab	630	0.730	None				0	180	New	4.4.7-A1	Basement Zone
WallBG	465	0.070	None			13.0	0	90	New	4.3.5-A10/4.3.13-J9	Basement Zone
Wall	126	0.074	R-19				340	90	New	4.3.1-A5	Basement Zone
Wall	149	0.074	R-19				0	90	New	4.3.1-A5	Basement Zone
Door	19	0.500	None				0	90	New	4.5.1-A4	Basement Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²		Azm	Status	Glazing Type	Location/Comments
1	Window	51.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
2	Window	30.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
3	Window	30.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
4	Window	24.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
5	Window	20.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
6	Window	68.5	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
7	Window	76.5	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
8	Window	60.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
9	Window	60.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
10	Window	53.8	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
11	Window	20.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
12	Window	70.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
13	Window	60.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
14	Window	90.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
15	Window	11.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
16	Window	40.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	Bug Screen	0.76												
2	Bug Screen	0.76												
3	Bug Screen	0.76	8.0	3.8	5.0	0.1	4.0	4.0						
4	Bug Screen	0.76	8.0	3.0	5.0	0.1	4.0	4.0						
5	Bug Screen	0.76												
6	Bug Screen	0.76	9.9	6.9	10.0	0.1	6.0	6.0						
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76	9.9	6.0	14.0	0.1	6.0	6.0						
10	Bug Screen	0.76	6.0	9.0	5.0	0.1	4.0	4.0						
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76												
16	Bug Screen	0.76												

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name
2-Unit Condo (0.1%) BASE CASE

Building Type ☐ Single Family ☐ Addition Alone
☒ Multi Family ☐ Existing+ Addition/Alteration

Date
10/13/2010

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Wall	9	0.074	R-19				250	90	New	4.3.1-A5	Basement Zone
Roof	930	0.036	R-30				0	0	New	4.2.2-A16	2nd Floor Zone
Wall	322	0.074	R-19				340	90	New	4.3.1-A5	2nd Floor Zone
Wall	295	0.074	R-19				160	90	New	4.3.1-A5	2nd Floor Zone
Wall	204	0.074	R-19				70	90	New	4.3.1-A5	2nd Floor Zone
Wall	26	0.074	R-19				250	90	New	4.3.1-A5	2nd Floor Zone
Roof	198	0.036	R-30				0	0	New	4.2.2-A16	1st Floor Zone
Wall	244	0.074	R-19				0	90	New	4.3.1-A5	1st Floor Zone
Door	21	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	206	0.074	R-19				340	90	New	4.3.1-A5	1st Floor Zone
Wall	311	0.074	R-19				160	90	New	4.3.1-A5	1st Floor Zone
Wall	46	0.074	R-19				70	90	New	4.3.1-A5	1st Floor Zone
Wall	40	0.074	R-19				250	90	New	4.3.1-A5	1st Floor Zone
Roof	161	0.053	None			30.0	0	0	New	4.2.6-A7	Basement Zone
Roof	6	0.036	R-30				0	0	New	4.2.2-A16	Basement Zone
Wall	82	0.074	R-19				160	90	New	4.3.1-A5	Basement Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²		Azm	Status	Glazing Type	Location/Comments
17	Window	18.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
18	Window	55.5	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
19	Window	28.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	Basement Zone
20	Window	54.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	Basement Zone
21	Window	10.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
22	Window	24.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
23	Window	24.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
24	Window	25.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
25	Window	70.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
26	Window	44.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
27	Window	18.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
28	Window	60.0	0.330	NFRC	0.31	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
29	Window	28.0	0.330	NFRC	0.31	70	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
30	Window	156.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
31	Window	50.0	0.330	NFRC	0.31	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
32	Window	125.0	0.330	NFRC	0.31	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
17	Bug Screen	0.76												
18	Bug Screen	0.76												
19	Bug Screen	0.76												
20	Bug Screen	0.76												
21	Bug Screen	0.76												
22	Bug Screen	0.76												
23	Bug Screen	0.76	6.7	12.0	10.0	0.1	6.0	6.0						
24	Bug Screen	0.76												
25	Bug Screen	0.76												
26	Bug Screen	0.76												
27	Bug Screen	0.76												
28	Bug Screen	0.76												
29	Bug Screen	0.76												
30	Bug Screen	0.76	9.0	17.4	5.0	0.1	4.0	4.0						
31	Bug Screen	0.76												
32	Bug Screen	0.76												

CF-1R

Date
10/13/2010

[illegible][illegible]

EXTERIOR SHADING DETAILS

[illegible]

CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) **CF-1R**

Project Name 2-Unit Condo (0.1%) BASE CASE	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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BUILDING ZONE INFORMATION

System Name	Zone Name	Floor Area (ft ²)				Volume	Year Built
		New	Existing	Altered	Removed		
Unit A System	Second Floor	900				8,910	
	First Floor	1,014				8,213	
	Basement	630				5,103	
Unit B System	Second Floor	930				8,370	
	First Floor	646				6,848	
	Basement	1,082				8,764	
Totals		5,202	0	0	0		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
Unit A System	1	Central Furnace	80% AFUE	No Cooling	13.0 SEER	Setback	New
Unit B System	1	Central Furnace	80% AFUE	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
Unit A System	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	New
Unit B System	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	New
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

WATER HEATING SYSTEMS

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
A.O. SMITH FPS-50-224	2	Small Gas	Kitchen Pipe Ins	43,000	50	0.60	n/a	n/a	New

MULTI-FAMILY WATER HEATING DETAILS

HYDRONIC HEATING SYSTEM PIPING

Control	Qty.	HP	Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name 2-Unit Condo (0.1%) BASE CASE		Date 10/13/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			
<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-11T14:08:44 ID: 8261R Page 10 of 14 </div>			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name 2-Unit Condo (0.1%) BASE CASE		Date 10/13/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft ² or 100 watts for dwelling units larger than 2,500 ft ² may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-11T14:08:44 ID: 8261R Page 11 of 14			

Project Name

Date _____

2-Unit Condo (0.1%) BASE CASE

10/13/2010

\$150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

\$150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. **EXCEPTION 1:** Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-occupant sensor that complies with the applicable requirements of §119. **EXCEPTION 2:** Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

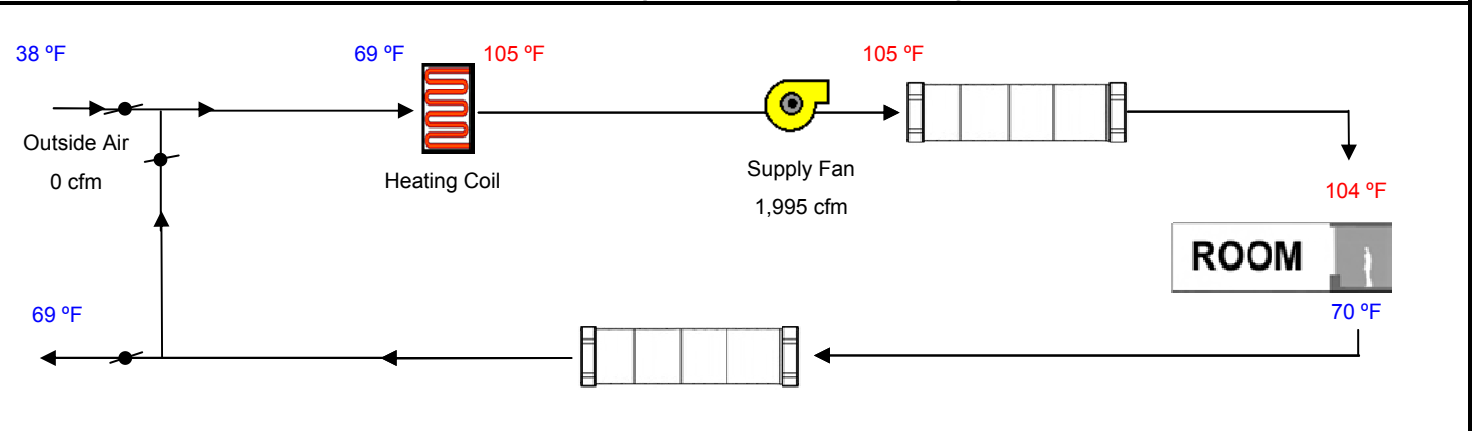
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name 2-Unit Condo (0.1%) BASE CASE	Date 10/13/2010
System Name Unit A System	Floor Area 2,544

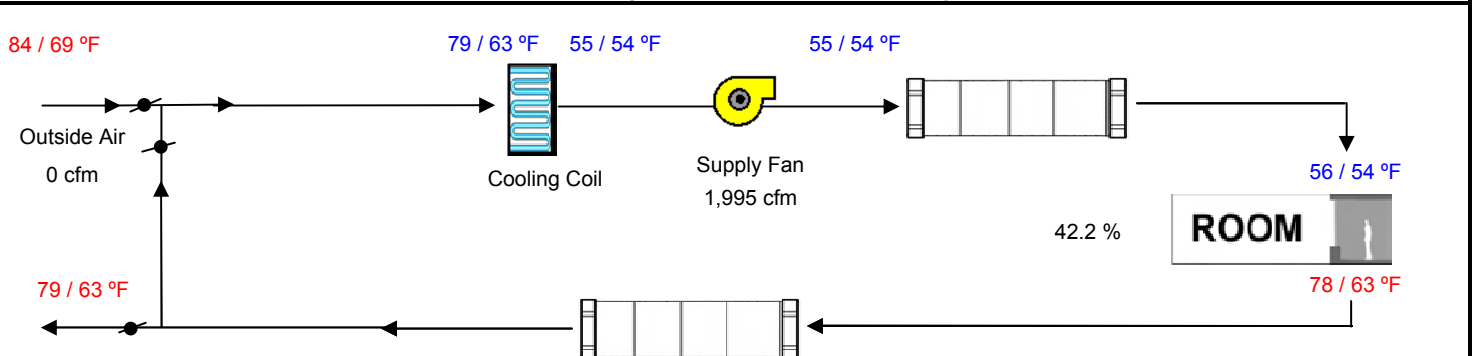
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	1	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System		CFM	Sensible	Latent	CFM	Sensible
Output per System	35,000	1,985	46,993	3,320	690	25,527
Total Output (Btuh)	35,000		0			
Output (Btuh/sqft)	13.8		2,107			1,241
			0			0
Cooling System						
Output per System	0	0	0	0	0	0
Total Output (Btuh)	0		0			0
Total Output (Tons)	0.0		2,107			1,241
Total Output (Btuh/sqft)	0.0					
Total Output (sqft/Ton)	0.0					
		TOTAL SYSTEM LOAD				28,009

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. 310JAV024045	0	0		35,000
Airflow (cfm)	1,995					
Airflow (cfm/sqft)	0.78					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output (Adjusted for Peak Design conditions)		0	0	35,000
Outside Air (cfm/sqft)	0.00					
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK		Aug 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



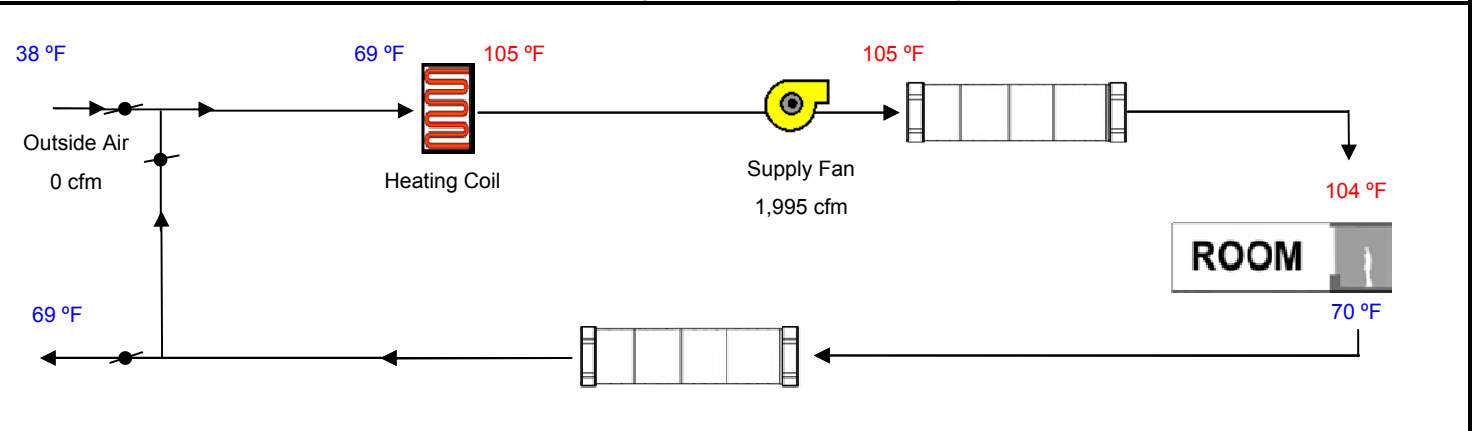
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name 2-Unit Condo (0.1%) BASE CASE	Date 10/13/2010
System Name Unit B System	Floor Area 2,658

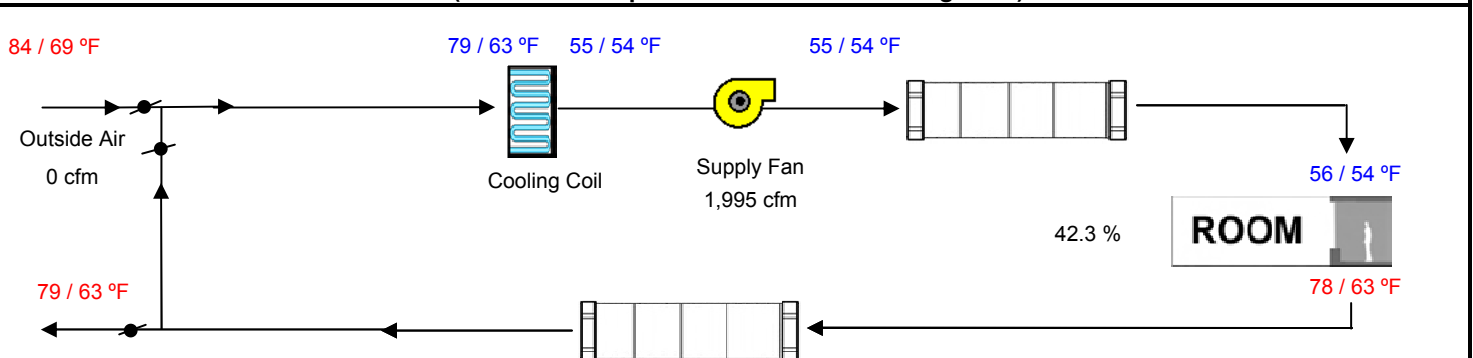
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	1	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System		CFM	Sensible	Latent	CFM	Sensible
Output per System	35,000	2,007	47,481	3,361	729	26,953
Total Output (Btuh)	35,000		0			
Output (Btuh/sqft)	13.2		2,129			1,310
			0			0
Cooling System		CFM	Sensible	Latent	CFM	Sensible
Output per System	0	0	0	0	0	0
Total Output (Btuh)	0		0			0
Total Output (Tons)	0.0		2,129			1,310
Total Output (Btuh/sqft)	0.0					
Total Output (sqft/Ton)	0.0					
		TOTAL SYSTEM LOAD				29,573

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. 310JAV024045				35,000
Airflow (cfm)	1,995		0	0		
Airflow (cfm/sqft)	0.75					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output				35,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)				
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK			Aug 3 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



BUILDING ENERGY ANALYSIS REPORT

PROJECT:

2-Unit Condo (15%) All ECM's
2208 Manhattan Avenue/2207 Bayview
Manhattan Beach, CA 90266

Project Designer:

Michael Lee Architects, Inc.
2200 Highland Avenue
Manhattan Beach, CA 90266
(310) 545-5771

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

8261R

Date:

10/16/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

TABLE OF CONTENTS

Cover Page	1
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Form CF-1R Certificate of Compliance	3
Form MF-1R Mandatory Measures Summary	10
HVAC System Heating and Cooling Loads Summary	13
Form ECON-1 Energy Use and Cost Summary	15

PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)		CF-1R																																																																																																																																					
Project Name 2-Unit Condo (15%) All ECM's			Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration				Date 10/16/2010																																																																																																																																						
Project Address 2208 Manhattan Avenue/2207 Bayview M			California Energy Climate Zone CA Climate Zone 06		Total Cond. Floor Area 5,202		Addition n/a		# of Stories 3																																																																																																																																				
FIELD INSPECTION ENERGY CHECKLIST <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.																																																																																																																																													
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Unit B System (80% to 95%	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	New																																																																																																																																								
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5">WATER HEATING</th> </tr> <tr> <th>Qty.</th> <th>Type</th> <th>Gallons</th> <th>Min. Eff</th> <th>Distribution</th> <th>Status</th> </tr> <tr> <td>2</td> <td>Instant Gas</td> <td>0</td> <td>0.84</td> <td>Kitchen Pipe Ins</td> <td>New</td> </tr> </table>										WATER HEATING					Qty.	Type	Gallons	Min. Eff	Distribution	Status	2	Instant Gas	0	0.84	Kitchen Pipe Ins	New																																																																																																																			
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PERFORMANCE CERTIFICATE: Residential**(Part 2 of 5)****CF-1R**

Project Name

2-Unit Condo (15%) All ECM's

Building Type

☐ Single Family☐ Addition Alone☒ Multi Family☐ Existing+ Addition/Alteration

Date

10/16/2010

SPECIAL FEATURES INSPECTION CHECKLIST

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

The HVAC System Carrier Corp. 58MXB040-12x does not include a cooling system, field verification is not necessary.

HIGH MASS Design - Verify Thermal Mass: 630.0 ft² Covered Slab Floor, 3.500" thick at Basement

HIGH MASS Design - Verify Thermal Mass: 465 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement

The HVAC System Carrier Corp. 58MXB040-12x does not include a cooling system, field verification is not necessary.

HIGH MASS Design - Verify Thermal Mass: 65 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement

HIGH MASS Design - Verify Thermal Mass: 1,028.0 ft² Covered Slab Floor, 3.500" thick at Basement

HIGH MASS Design - Verify Thermal Mass: 575 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

Compliance credit for quality installation of insulation has been used. HERS field verification is required.

Compliance credit for quality installation of insulation has been used. HERS field verification is required.

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name 2-Unit Condo (15%) All ECM's	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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ANNUAL ENERGY USE SUMMARY

	Standard	Proposed	Margin
TDV (kBtu/ft ² -yr)			
Space Heating	20.00	16.45	3.55
Space Cooling	0.23	0.35	-0.12
Fans	3.19	3.22	-0.03
Domestic Hot Water	15.80	11.90	3.91
Pumps	0.00	0.00	0.00
Totals	39.22	31.90	7.31
Percent Better Than Standard:			18.6 %

BUILDING COMPLIES - HERS VERIFICATION REQUIRED

Building Front Orientation:	(S) 160 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	2.00	(S)	1,778	628
Fuel Available at Site:	Natural Gas	(W)	989	639
Raised Floor Area:	470	(N)	2,582	657
Slab on Grade Area:	1,658	(E)	510	43
Average Ceiling Height:	8.9	Roof	2,356	0
Fenestration Average U-Factor:	0.33		TOTAL:	1,967
Average SHGC:	0.31		Fenestration/CFA Ratio:	37.8 %

REMARKS

BASE CASE: Framed Walls are insulated to R-19. Basement Retaining Walls ARE insulated to R-13. Two 50 gal. W.H. 0.60 EF. 470 sf Floor has R-30 Batts.

15% CASE:

ECM-8 Furnace upgrade - AFUE 80% to 95%: 8.0%;

ECM-6 - Quality Insulation Installation (Needs HERS): 2.3%.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Company **NEWTON ENERGY**

Address **1401 19th Street**

Name **Rick Newton**

City/State/Zip **Manhattan Beach, CA 90266**

Phone **310 375-2699**



10/16/2010

Signed

Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company **Michael Lee Architects, Inc.**

Address **2200 Highland Avenue**

Name **Michael Lee**

City/State/Zip **Manhattan Beach, CA 90266**

Phone **(310) 545-5771**

Signed

License #

Date

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name 2-Unit Condo (15%) All ECM's	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	900	0.036	R-30				0	0	New	4.2.2-A16	2nd Floor Zone
Wall	352	0.074	R-19				340	90	New	4.3.1-A5	2nd Floor Zone
Wall	214	0.074	R-19				160	90	New	4.3.1-A5	2nd Floor Zone
Wall	130	0.074	R-19				70	90	New	4.3.1-A5	2nd Floor Zone
Wall	111	0.074	R-19				250	90	New	4.3.1-A5	2nd Floor Zone
Floor	470	0.033	R-30				0	180	New	4.4.2-A15	1st Floor Zone
Roof	161	0.036	R-30				0	0	New	4.2.2-A16	1st Floor Zone
Wall	320	0.074	R-19				340	90	New	4.3.1-A5	1st Floor Zone
Wall	249	0.074	R-19				160	90	New	4.3.1-A5	1st Floor Zone
Wall	87	0.074	R-19				70	90	New	4.3.1-A5	1st Floor Zone
Wall	130	0.074	R-19				250	90	New	4.3.1-A5	1st Floor Zone
Slab	630	0.730	None				0	180	New	4.4.7-A1	Basement Zone
WallBG	465	0.070	None			13.0	0	90	New	4.3.5-A10/4.3.13-J9	Basement Zone
Wall	126	0.074	R-19				340	90	New	4.3.1-A5	Basement Zone
Wall	149	0.074	R-19				0	90	New	4.3.1-A5	Basement Zone
Door	19	0.500	None				0	90	New	4.5.1-A4	Basement Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
1	Window	51.0	0.330 NFRC	0.31 NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
2	Window	30.0	0.330 NFRC	0.31 NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
3	Window	30.0	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
4	Window	24.0	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
5	Window	20.0	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
6	Window	68.5	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
7	Window	76.5	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
8	Window	60.0	0.330 NFRC	0.31 NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
9	Window	60.0	0.330 NFRC	0.31 NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
10	Window	53.8	0.330 NFRC	0.31 NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
11	Window	20.0	0.330 NFRC	0.31 NFRC	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
12	Window	70.0	0.330 NFRC	0.31 NFRC	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
13	Window	60.0	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
14	Window	90.0	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
15	Window	11.0	0.330 NFRC	0.31 NFRC	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
16	Window	40.0	0.330 NFRC	0.31 NFRC	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	Bug Screen	0.76												
2	Bug Screen	0.76												
3	Bug Screen	0.76	8.0	3.8	5.0	0.1	4.0	4.0						
4	Bug Screen	0.76	8.0	3.0	5.0	0.1	4.0	4.0						
5	Bug Screen	0.76												
6	Bug Screen	0.76	9.9	6.9	10.0	0.1	6.0	6.0						
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76	9.9	7.4	14.0	0.1	6.0	6.0						
10	Bug Screen	0.76	6.0	9.0	5.0	0.1	4.0	4.0						
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76												
16	Bug Screen	0.76												

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name 2-Unit Condo (15%) All ECM's	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Wall	9	0.074	R-19				250	90	New	4.3.1-A5	Basement Zone
Roof	930	0.036	R-30				0	0	New	4.2.2-A16	2nd Floor Zone
Wall	322	0.074	R-19				340	90	New	4.3.1-A5	2nd Floor Zone
Wall	295	0.074	R-19				160	90	New	4.3.1-A5	2nd Floor Zone
Wall	204	0.074	R-19				70	90	New	4.3.1-A5	2nd Floor Zone
Wall	26	0.074	R-19				250	90	New	4.3.1-A5	2nd Floor Zone
Roof	198	0.036	R-30				0	0	New	4.2.2-A16	1st Floor Zone
Wall	244	0.074	R-19				0	90	New	4.3.1-A5	1st Floor Zone
Door	21	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	206	0.074	R-19				340	90	New	4.3.1-A5	1st Floor Zone
Wall	311	0.074	R-19				160	90	New	4.3.1-A5	1st Floor Zone
Wall	46	0.074	R-19				70	90	New	4.3.1-A5	1st Floor Zone
Wall	40	0.074	R-19				250	90	New	4.3.1-A5	1st Floor Zone
Roof	161	0.053	None			30.0	0	0	New	4.2.6-A7	Basement Zone
Roof	6	0.036	R-30				0	0	New	4.2.2-A16	Basement Zone
Wall	82	0.074	R-19				160	90	New	4.3.1-A5	Basement Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹		SHGC ²		Azm	Status	Glazing Type	Location/Comments
17	Window	18.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
18	Window	55.5	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
19	Window	28.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	Basement Zone
20	Window	54.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	Basement Zone
21	Window	10.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
22	Window	24.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
23	Window	24.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
24	Window	25.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
25	Window	70.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
26	Window	44.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
27	Window	18.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
28	Window	60.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
29	Window	28.0	0.330	NFRC	0.31	NFRC	70	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
30	Window	156.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
31	Window	50.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
32	Window	125.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
17	Bug Screen	0.76												
18	Bug Screen	0.76												
19	Bug Screen	0.76												
20	Bug Screen	0.76												
21	Bug Screen	0.76												
22	Bug Screen	0.76												
23	Bug Screen	0.76	6.7	12.0	10.0	0.1	6.0	6.0						
24	Bug Screen	0.76												
25	Bug Screen	0.76												
26	Bug Screen	0.76												
27	Bug Screen	0.76												
28	Bug Screen	0.76												
29	Bug Screen	0.76												
30	Bug Screen	0.76	9.0	17.4	5.0	0.1	4.0	4.0						
31	Bug Screen	0.76												
32	Bug Screen	0.76												

CF-1R

10/16/2010

[illegible][illegible]

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

[illegible]

CERTIFICATE OF COMPLIANCE: Residential **(Part 5 of 5)** **CF-1R**

Project Name 2-Unit Condo (15%) All ECM's	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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BUILDING ZONE INFORMATION

System Name	Zone Name	Floor Area (ft ²)				Volume	Year Built
		New	Existing	Altered	Removed		
Unit A System (80% to 95%)	Second Floor	900				8,910	
	First Floor	1,014				8,213	
	Basement	630				5,103	
Unit B System (80% to 95%)	Second Floor	930				8,370	
	First Floor	646				6,848	
	Basement	1,082				8,764	
Totals		5,202	0	0	0		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
Unit A System (80% to 95%)	1	Central Furnace	95% AFUE	No Cooling	13.0 SEER	Setback	New
Unit B System (80% to 95%)	1	Central Furnace	95% AFUE	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
Unit A System (80% to 95%)	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	New
Unit B System (80% to 95%)	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	New
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

WATER HEATING SYSTEMS

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
TAKAGI T-K1	2	Instant Gas	Kitchen Pipe Ins	165,000	0	0.84	n/a	n/a	New

MULTI-FAMILY WATER HEATING DETAILS

HYDRONIC HEATING SYSTEM PIPING

Control			Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
	Qty.	HP	<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name 2-Unit Condo (15%) All ECM's		Date 10/16/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			
<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:46:21 ID: 8261R Page 10 of 15 </div>			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name 2-Unit Condo (15%) All ECM's		Date 10/16/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft ² or 100 watts for dwelling units larger than 2,500 ft ² may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:46:21 ID: 8261R Page 11 of 15			

Date

10/16/2010

\$150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

\$150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. **EXCEPTION 1:** Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-occupant sensor that complies with the applicable requirements of §119. **EXCEPTION 2:** Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

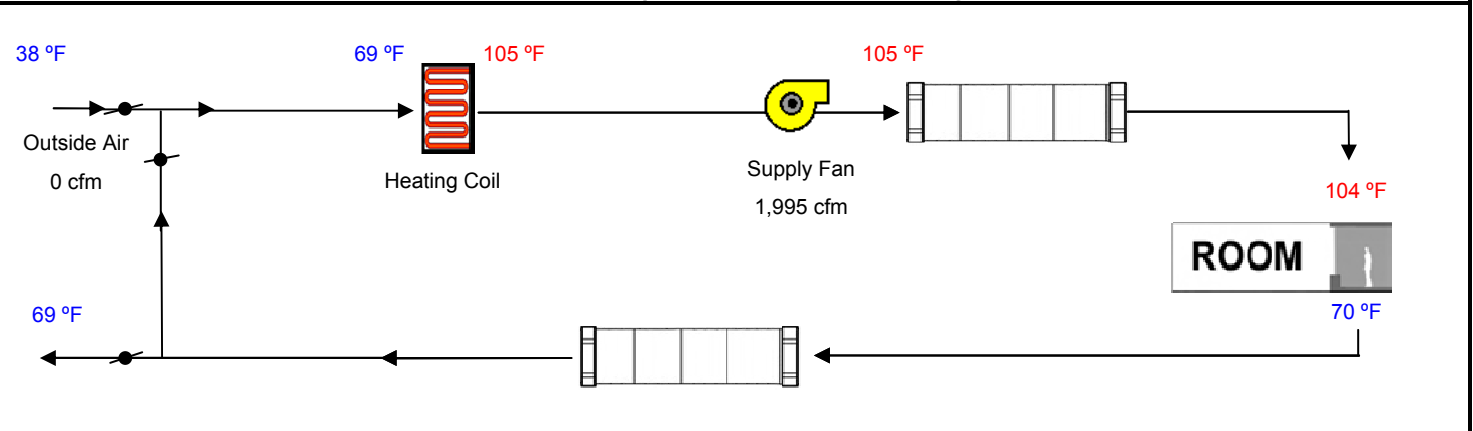
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name 2-Unit Condo (15%) All ECM's	Date 10/16/2010
System Name Unit A System (80% to 95%)	Floor Area 2,544

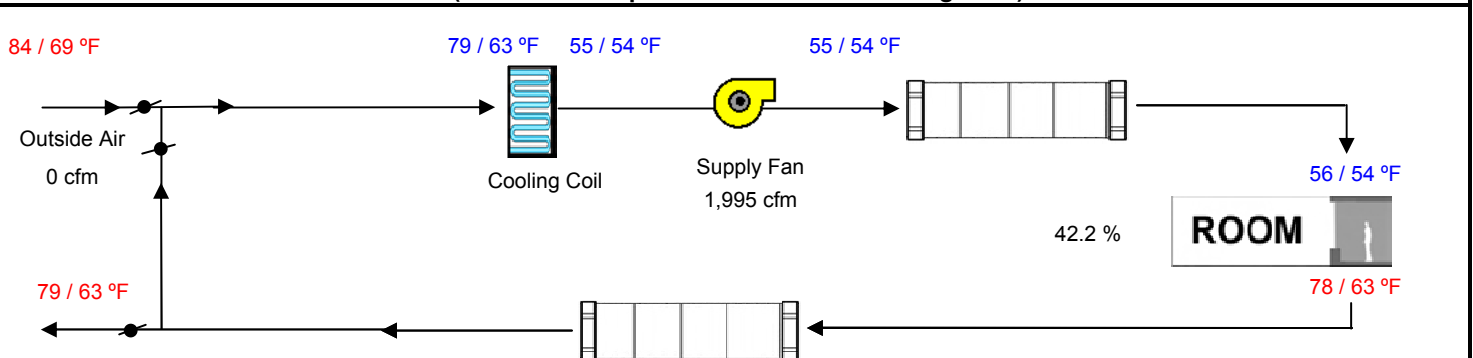
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	1	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System		CFM	Sensible	Latent	CFM	Sensible
Output per System	38,000	1,985	46,993	3,320	690	25,527
Total Output (Btuh)	38,000		0			
Output (Btuh/sqft)	14.9		2,107			1,241
			0			0
Cooling System						
Output per System	0	0	0	0	0	0
Total Output (Btuh)	0		0			0
Total Output (Tons)	0.0		2,107			1,241
Total Output (Btuh/sqft)	0.0					
Total Output (sqft/Ton)	0.0					
		TOTAL SYSTEM LOAD		51,207	3,320	28,009

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. 58MXB040-12x	0	0		38,000
Airflow (cfm)	1,995					
Airflow (cfm/sqft)	0.78					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output		0	0	38,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)				
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK		Aug 3 PM	Jan 1 AM	

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



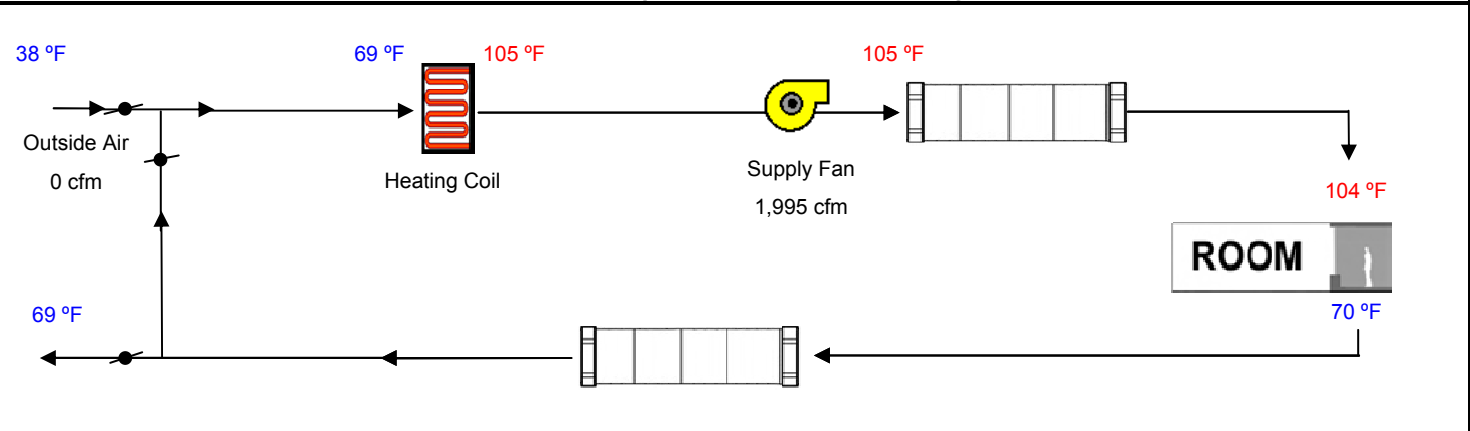
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name 2-Unit Condo (15%) All ECM's	Date 10/16/2010
System Name Unit B System (80% to 95%)	Floor Area 2,658

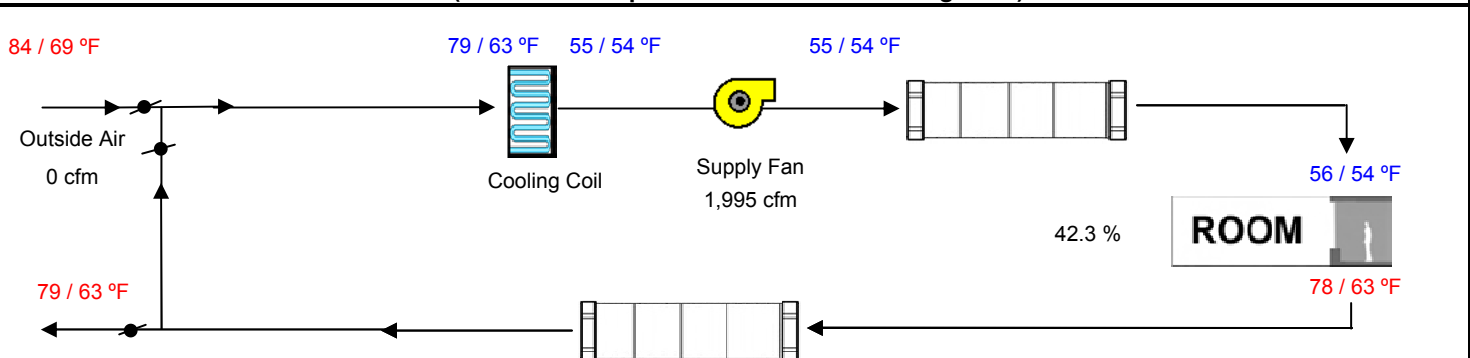
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	1	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System		CFM	Sensible	Latent	CFM	Sensible
Output per System	38,000	2,007	47,481	3,361	729	26,953
Total Output (Btuh)	38,000		0			
Output (Btuh/sqft)	14.3		2,129			1,310
			0			0
Cooling System						
Output per System	0	0	0	0	0	0
Total Output (Btuh)	0		0			0
Total Output (Tons)	0.0		2,129			1,310
Total Output (Btuh/sqft)	0.0					
Total Output (sqft/Ton)	0.0	TOTAL SYSTEM LOAD		51,740	3,361	29,573

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. 58MXB040-12x		0	0	38,000
Airflow (cfm)	1,995					
Airflow (cfm/sqft)	0.75					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output		0	0	38,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)				
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK		Aug 3 PM	Jan 1 AM	

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



ENERGY USE AND COST SUMMARY

ECON-1

Project Name

2-Unit Condo (15%) All ECM's

Date

10/16/2010

Rate: SCE GS-1

Fuel Type: Electricity

	STANDARD			PROPOSED			MARGIN		
	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)
Jan	212	2	31	210	2	31	2	0	0
Feb	178	2	29	185	4	29	-7	-1	0
Mar	193	2	30	194	2	30	-2	0	0
Apr	137	2	27	139	3	27	-3	-1	0
May	95	2	25	94	2	25	1	0	0
Jun	41	3	22	44	4	22	-3	-2	0
Jul	44	3	22	46	4	22	-2	-1	0
Aug	47	4	23	48	4	23	-1	0	0
Sep	62	5	23	66	5	23	-4	0	0
Oct	40	0	22	41	0	22	-1	0	0
Nov	117	2	26	123	3	26	-6	-1	0
Dec	231	4	32	246	5	32	-15	-1	-1
Year	1,396	5	311	1,437	5	313	-40	0	-2
CO ₂	1,124	lbs/yr		1,157	lbs/yr		-32	lbs/yr	

Rate: SoCal GN-10

Fuel Type: Natural Gas

	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)
Jan	178	141	59	142	125	47	36	16	12
Feb	149	131	49	120	117	40	29	14	10
Mar	164	118	54	133	103	44	31	15	10
Apr	120	120	39	96	98	32	23	22	8
May	91	137	30	70	110	23	20	27	7
Jun	46	17	15	34	23	11	11	-5	4
Jul	46	13	15	34	18	11	12	-5	4
Aug	46	12	15	34	12	11	12	1	4
Sep	44	23	15	33	34	11	11	-11	4
Oct	48	36	16	36	31	12	12	5	4
Nov	104	121	34	83	107	27	21	14	7
Dec	184	170	61	148	149	49	36	21	12
Year	1,218	170	401	963	149	317	255	21	84
CO ₂	14,253	lbs/yr		11,268	lbs/yr		2,986	lbs/yr	

Annual Totals	Energy	Demand	Cost	Cost/sqft	Virtual Rate
Electricity	1,437 kWh	5 kW	\$ 313	\$ 0.06 /sqft	\$ 0.22 /kWh
Natural Gas	963 therms	149 kBtu/hr	\$ 317	\$ 0.06 /sqft	\$ 0.33 /therm
		Total	\$ 630	\$ 0.12 /sqft	

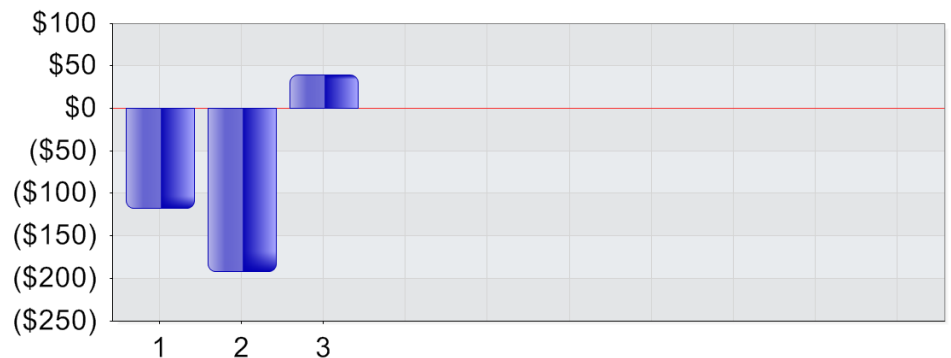
Avoided CO₂ Emissions:

2,953 lbs/yr

LCC-1

Date _____

10/19/2010

[illegible][illegible]

BUILDING ENERGY ANALYSIS REPORT

PROJECT:

The Strand SFR (0.0%) BASE CASE
3516 The Strand
Manhattan Beach, CA 90266

Project Designer:

Sexton Homes
PO Box 1795
Manhattan Beach, CA 90267
(310) 545-3432

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

7273R

Date:

10/13/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

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PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)	CF-1R																																																																																																
Project Name <i>The Strand SFR (0.0%) BASE CASE</i>		Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration				Date <i>10/13/2010</i>																																																																																																	
Project Address <i>3516 The Strand Manhattan Beach</i>		California Energy Climate Zone <i>CA Climate Zone 06</i>		Total Cond. Floor Area <i>5,551</i>		Addition <i>n/a</i>																																																																																																	
						# of Stories <i>3</i>																																																																																																	
FIELD INSPECTION ENERGY CHECKLIST <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.																																																																																																							
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Location	Heating	Cooling	Duct Location	Duct R-Value	Status																																																																																																		
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WATER HEATING <table border="1"> <thead> <tr> <th>Qty.</th> <th>Type</th> <th>Gallons</th> <th>Min. Eff</th> <th>Distribution</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Small Gas</td> <td>65</td> <td>0.58</td> <td>Kitchen Pipe Ins</td> <td>New</td> </tr> <tr><td colspan="6"> </td></tr> <tr><td colspan="6"> </td></tr> </tbody> </table>								Qty.	Type	Gallons	Min. Eff	Distribution	Status	1	Small Gas	65	0.58	Kitchen Pipe Ins	New																																																																																				
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EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-13T08:02:33 ID: 7273R Page 3 of 15																																																																																																							

PERFORMANCE CERTIFICATE: Residential**(Part 2 of 5)****CF-1R**

Project Name

The Strand SFR (0.0%) BASE CASE

Building Type

☒ Single Family☐ Addition Alone☐ Multi Family☐ Existing+ Addition/Alteration

Date

*10/13/2010***SPECIAL FEATURES INSPECTION CHECKLIST**

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

The HVAC System copy of Carrier Corp. 48HJD0053 does not include a cooling system, field verification is not necessary.

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

Compliance credit for quality installation of insulation has been used. HERS field verification is required.

The HVAC System Whole House Systems has the HVAC unit and no more than 12 feet of Ducts and Plenums located outside conditioned space. A certified HERS rater must visually verify the installation of all Ducts and Plenums.

The HVAC System Whole House Systems incorporates HERS verified Duct Leakage. HERS field verification and diagnostic testing is required to verify that duct leakage meets the specified criteria.

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name <i>The Strand SFR (0.0%) BASE CASE</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/13/2010</i>
--	---	---------------------------

ANNUAL ENERGY USE SUMMARY

	Standard	Proposed	Margin
TDV (kBtu/ft ² -yr)			
Space Heating	8.75	8.92	-0.18
Space Cooling	1.32	1.18	0.14
Fans	1.77	1.78	-0.02
Domestic Hot Water	6.96	6.90	0.06
Pumps	0.00	0.00	0.00
Totals	18.79	18.78	0.00
Percent Better Than Standard:			0.0 %

BUILDING COMPLIES - HERS VERIFICATION REQUIRED

Building Front Orientation:	(SE) 142 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	1.00	(SE)	2,011	288
Fuel Available at Site:	Natural Gas	(SW)	956	347
Raised Floor Area:	656	(NW)	2,557	330
Slab on Grade Area:	2,115	(NE)	454	113
Average Ceiling Height:	10.2	Roof	2,767	45
Fenestration Average U-Factor:	0.57		TOTAL:	1,123
Average SHGC:	0.36		Fenestration/CFA Ratio:	20.2 %

REMARKS


BASE CASE: Less than 12' of ducts are in unconditioned space. Furnace is an 81% AFUE unit. Retaining Walls in basement are insulated. West Facing Glazing is monolithic. Quality Insulation Installation has been specified - This measure requires verification by a certified HERS Rater. Duct Testing has been specified. - This measure requires verification by a certified HERS Rater. R-30 Floor Insulation has been specified.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Company	NEWTON ENERGY		10/13/2010
Address	1401 19th Street		
City/State/Zip	Manhattan Beach, CA 90266		
Name	Rick Newton		
Phone	310 375-2699	Signed	Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company	Sexton Homes		License #	Date
Address	PO Box 1795			
City/State/Zip	Manhattan Beach, CA 90267			
Name				
Phone	(310) 545-3432	Signed		

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name The Strand SFR (0.0%) BASE CASE	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	497	0.036	R-30				251	1	New	4.2.2-A16	2nd Floor Zone
Roof	496	0.036	R-30				341	1	New	4.2.2-A16	2nd Floor Zone
Roof	482	0.036	R-30				71	1	New	4.2.2-A16	2nd Floor Zone
Roof	496	0.036	R-30				161	1	New	4.2.2-A16	2nd Floor Zone
Floor	598	0.034	R-30				0	180	New	4.4.2-A7	2nd Floor Zone
Wall	275	0.102	R-13				251	90	New	4.3.1-A3	2nd Floor Zone
Wall	873	0.102	R-13				341	90	New	4.3.1-A3	2nd Floor Zone
Wall	252	0.102	R-13				71	90	New	4.3.1-A3	2nd Floor Zone
Wall	843	0.102	R-13				161	90	New	4.3.1-A3	2nd Floor Zone
Floor	58	0.034	R-30				0	180	New	4.4.2-A7	1st Floor Zone
Wall	182	0.102	R-13				251	90	New	4.3.1-A3	1st Floor Zone
Wall	494	0.102	R-13				341	90	New	4.3.1-A3	1st Floor Zone
Wall	123	0.102	R-13				0	90	New	4.3.1-A3	1st Floor Zone
Door	23	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	89	0.102	R-13				71	90	New	4.3.1-A3	1st Floor Zone
Wall	593	0.102	R-13				161	90	New	4.3.1-A3	1st Floor Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
1	Skylight	12.6	0.370 NFRC	0.29 NFRC	251	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
2	Skylight	6.3	0.370 NFRC	0.29 NFRC	341	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
3	Skylight	20.0	0.370 NFRC	0.29 NFRC	71	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
4	Skylight	6.3	0.370 NFRC	0.29 NFRC	161	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
5	Window	88.0	0.930 COG	0.44 COG	251	New	PPG Azuria Mono.Non-Metal D/	2nd Floor Zone
6	Window	98.0	0.370 NFRC	0.32 NFRC	341	New	IWC 5300 Vinyl/Low-E	2nd Floor Zone
7	Window	65.0	0.370 NFRC	0.32 NFRC	71	New	IWC 5300 Vinyl/Low-E	2nd Floor Zone
8	Window	150.0	0.370 NFRC	0.32 NFRC	161	New	IWC 5300 Vinyl/Low-E	2nd Floor Zone
9	Window	125.0	0.930 COG	0.44 COG	251	New	PPG Azuria Mono.Non-Metal D/	1st Floor Zone
10	Window	110.0	0.370 NFRC	0.32 NFRC	341	New	IWC 5300 Vinyl/Low-E	1st Floor Zone
11	Window	36.0	0.340 NFRC	0.33 NFRC	71	New	Andersen Permashield	1st Floor Zone
12	Window	12.0	0.370 NFRC	0.32 NFRC	71	New	IWC 5300 Vinyl/Low-E	1st Floor Zone
13	Window	60.0	0.370 NFRC	0.32 NFRC	161	New	IWC 5300 Vinyl/Low-E	1st Floor Zone
14	Window	134.0	0.930 COG	0.44 COG	251	New	PPG Azuria Mono.Non-Metal D/	Basement Zone
15	Window	122.0	0.370 NFRC	0.32 NFRC	341	New	IWC 5300 Vinyl/Low-E	Basement Zone
16	Window	78.0	0.370 NFRC	0.32 NFRC	161	New	IWC 5300 Vinyl/Low-E	Basement Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	None	1.00												
3	None	1.00												
4	None	1.00												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76												
16	Bug Screen	0.76												

CF-1R

Date
10/13/2010

Surface Type	Area	U-Factor	Insulation					Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior	Frame					
Roof	751	0.036	R-30					71	1	New	4.2.2-A16	Basement Zone
Slab	2,115	0.730	None					0	180	New	4.4.7-A1	Basement Zone
Wall	152	0.102	R-13					251	90	New	4.3.1-A3	Basement Zone
Wall	454	0.102	R-13					341	90	New	4.3.1-A3	Basement Zone
Wall	287	0.102	R-13					161	90	New	4.3.1-A3	Basement Zone
Wall	260	0.102	R-13					0	90	New	4.3.1-A3	Basement Zone
WallBG	80	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	19	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	12	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	70	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	51	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	35	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	56	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	63	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	14	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	50	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone

[illegible]

EXTERIOR SHADING DETAILS

[illegible]

10/13/2010

[illegible][illegible]

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

[illegible]

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name The Strand SFR (0.0%) BASE CASE		Date 10/13/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			
<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-13T08:02:33 ID: 7273R Page 10 of 15 </div>			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name The Strand SFR (0.0%) BASE CASE		Date 10/13/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft2 or 100 watts for dwelling units larger than 2,500 ft2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
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MANDATORY MEASURES SUMMARY: Residential**(Page 3 of 3)****MF-1R**

Project Name

The Strand SFR (0.0%) BASE CASE

Date

10/13/2010

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on. EXCEPTION 2: Outdoor luminaires used to comply with Exception 1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

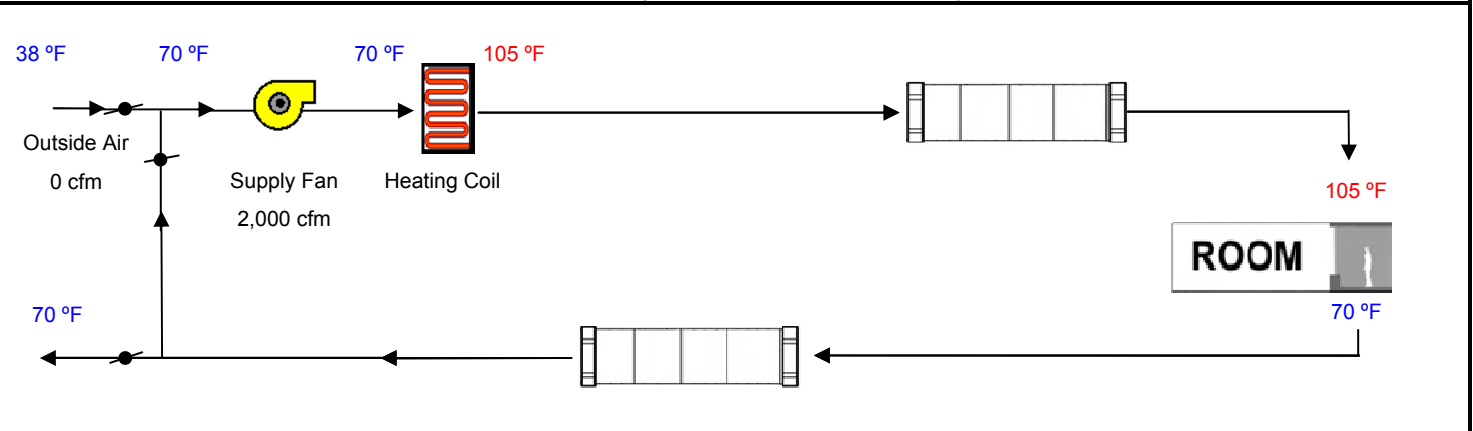
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name The Strand SFR (0.0%) BASE CASE	Date 10/13/2010
System Name Whole House Systems	Floor Area 5,551

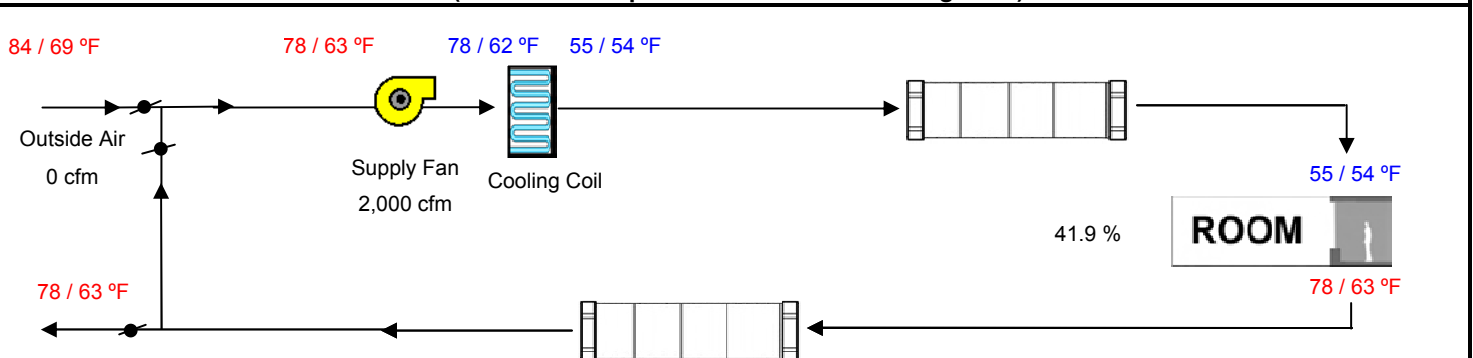
ENGINEERING CHECKS		SYSTEM LOAD					
Number of Systems	2	Total Room Loads Return Vented Lighting Return Air Ducts Return Fan Ventilation Supply Fan Supply Air Ducts TOTAL SYSTEM LOAD	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System			CFM	Sensible	Latent	CFM	Sensible
Output per System	57,000		2,104	51,421	3,373	1,647	61,357
Total Output (Btuh)	114,000			0			
Output (Btuh/sqft)	20.5			812			1,070
Cooling System				0			0
Output per System	0		0	0	0	0	0
Total Output (Btuh)	0			0			0
Total Output (Tons)	0.0			812			1,070
Total Output (Btuh/sqft)	0.0						
Total Output (sqft/Ton)	0.0			53,045	3,373		63,497

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,000	copy of Carrier Corp. 48HJD0053				
Airflow (cfm)	2,000		0	0		114,000
Airflow (cfm/sqft)	0.36					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output		0	0	114,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)				
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK		Aug 3 PM	Jan 1 AM	

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



ENERGY USE AND COST SUMMARY

ECON-1

Project Name
The Strand SFR (0.0%) BASE CASE

Date
10/13/2010

Rate: SCE GS-1

Fuel Type: Electricity

	STANDARD			PROPOSED			MARGIN		
	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)
Jan	110	2	26	112	2	26	-3	0	0
Feb	118	6	26	109	6	26	10	0	0
Mar	96	5	25	99	4	25	-3	1	0
Apr	87	5	24	79	6	24	8	-1	0
May	34	1	22	37	1	22	-2	0	0
Jun	79	8	24	86	9	24	-7	-1	0
Jul	49	8	23	47	8	23	2	0	0
Aug	56	7	23	59	8	23	-3	0	0
Sep	136	9	27	122	8	26	14	1	1
Oct	41	8	22	37	7	22	4	0	0
Nov	64	4	23	64	4	23	0	0	0
Dec	147	7	27	145	7	27	2	0	0
Year	1,017	9	293	994	9	292	23	0	1
CO ₂	819	lbs/yr		800	lbs/yr		19	lbs/yr	

Rate: SoCal GN-10

Fuel Type: Natural Gas

	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)
Jan	90	127	30	89	123	29	1	4	0
Feb	71	118	23	71	108	23	-1	10	0
Mar	74	105	24	76	96	25	-2	8	-1
Apr	49	95	16	51	88	17	-2	6	-1
May	34	89	11	35	83	12	-1	6	0
Jun	21	6	7	21	6	7	0	0	0
Jul	22	6	7	21	6	7	0	0	0
Aug	21	6	7	21	6	7	0	0	0
Sep	21	6	7	21	6	7	0	0	0
Oct	22	29	7	22	33	7	0	-4	0
Nov	47	108	15	47	99	16	-1	9	0
Dec	97	125	32	97	115	32	0	10	0
Year	568	127	187	573	123	188	-4	4	-1
CO ₂	6,647	lbs/yr		6,699	lbs/yr		-51	lbs/yr	

Annual Totals	Energy	Demand	Cost	Cost/sqft	Virtual Rate
Electricity	994 kWh	9 kW	\$ 292	\$ 0.05 /sqft	\$ 0.29 /kWh
Natural Gas	573 therms	123 kBtu/hr	\$ 188	\$ 0.03 /sqft	\$ 0.33 /therm
		Total	\$ 480	\$ 0.09 /sqft	

Avoided CO₂ Emissions: -33 lbs/yr

UTILITY INCENTIVE WORKSHEET

UTIL-1R

Project Name

The Strand SFR (0.0%) BASE CASE

Date

10/13/2010

Step 1 ANNUAL TDV ENERGY USE (kBtu/sqft-yr)

ENERGY COMPONENT	Standard	Proposed	Margin
Space Heating	8.75	8.92	-0.18
Space Cooling	1.32	1.18	0.14
Heat Rejection	0.00	0.00	0.00
Indoor Fans	1.77	1.78	-0.02
Domestic Hot Water	6.96	6.90	0.06
Pumps	0.00	0.00	0.00
TOTALS:	18.79	18.78	0.00

Step 2 PERCENT BELOW TITLE 24

% Better than		
Margin	Standard	Title 24*
0.00	18.79	0.0 %
Cooling	Standard	
0.12	3.08	3.8 %
Incentive Eligibility		
Owner Incentive (>=15%)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NSHP Incentive (>=30%)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Conditioned Floor Area =	5,551.0 ft ²	
Number of Bedrooms =	5	

Step 3 ANNUAL SITE ENERGY USE

Average 2pm - 5pm		Standard	Proposed	Margin	Single Orientation		
Peak Demand (kW)		1.8	1.5	0.3			
ENERGY COMPONENT	Standard		Proposed		Margin		
	Electricity (kWh)	Natural Gas (therms)	Electricity (kWh)	Natural Gas (therms)	Electricity (kWh)	Natural Gas (therms)	
	Space Heating	0.00	307.70	0.00	314.33	0.00	-6.63
	Space Cooling	301.08	0.00	263.20	0.00	37.88	0.00
	Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
	Indoor Fans	715.76	0.00	730.65	0.00	-14.89	0.00
	Domestic Hot Water	0.00	260.45	0.00	258.19	0.00	2.26
	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	TOTALS:	1,016.84	568.15	993.85	572.52	23.00	-4.37

Step 4 POTENTIAL OWNER INCENTIVE CALCULATION

Potential incentives indicated on this report are available only through the California Advanced Homes Program for new construction and are NOT GUARANTEED. Projects must meet all other program requirements to qualify. Potential incentives are subject to program limitations

	% Better than Title-24* (from step 2)	Incentive Rate	Savings (from Step 3)	Subtotal
Electricity (kWh)	n/a	n/a \$/kWh	n/a kWh	n/a
Electricity (kW)	n/a	n/a \$/kW	n/a kW	n/a
Natural Gas	n/a	n/a \$/therm	n/a therm	n/a
Base Incentive				n/a
Energy Star Incentive				n/a
Green Home Incentive				n/a
Compact Home Incentive				n/a
Photovoltaic Incentive				n/a
NSHP				n/a
Total				n/a



*% Better than in this equation is limited to 45%

BUILDING ENERGY ANALYSIS REPORT

PROJECT:

The Strand SFR (15%) All ECM's
3516 The Strand
Manhattan Beach, CA 90266

Project Designer:

Sexton Homes
PO Box 1795
Manhattan Beach, CA 90267
(310) 545-3432

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

7273R

Date:

10/20/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

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Form ECON-1 Energy Use and Cost Summary	14

PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)		CF-1R																																																																																																																										
Project Name <i>The Strand SFR (15%) All ECM's</i>			Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration				Date <i>10/20/2010</i>																																																																																																																											
Project Address <i>3516 The Strand Manhattan Beach</i>			California Energy Climate Zone <i>CA Climate Zone 06</i>		Total Cond. Floor Area <i>5,551</i>		Addition <i>n/a</i>		# of Stories <i>3</i>																																																																																																																									
FIELD INSPECTION ENERGY CHECKLIST <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.																																																																																																																																		
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PERFORMANCE CERTIFICATE: Residential

(Part 2 of 5)

CF-1R

Project Name

The Strand SFR (15%) All ECM's

Building Type

☒ Single Family☐ Addition Alone☐ Multi Family☐ Existing+ Addition/Alteration

Date

*10/20/2010***SPECIAL FEATURES INSPECTION CHECKLIST**

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

The HVAC System Carrier Corp. 58MXB040-12x does not include a cooling system, field verification is not necessary.

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

Compliance credit for quality installation of insulation has been used. HERS field verification is required.

The HVAC System Whole House Systems has Ducts, Plenums and the HVAC unit located totally within Conditioned space. A certified HERS rater must visually verify the installation of the HVAC unit and all Ducts and Plenums.

Whole House Systems includes verified duct systems that have air leakage to outside conditions equal to or less than 25 cfm. HERS field verification for ducts in conditioned space and duct leakage is required.

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name <i>The Strand SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/20/2010</i>
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ANNUAL ENERGY USE SUMMARY

TDV (kBtu/ft ² -yr)	Standard	Proposed	Margin
Space Heating	8.75	5.87	2.88
Space Cooling	1.31	0.93	0.37
Fans	1.76	1.52	0.25
Domestic Hot Water	6.96	7.02	-0.06
Pumps	0.00	0.00	0.00
Totals	18.77	15.34	3.43
Percent Better Than Standard:	18.3 %		

BUILDING COMPLIES - HERS VERIFICATION REQUIRED

Building Front Orientation:	(SE) 142 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	1.00	(SE)	2,011	288
Fuel Available at Site:	Natural Gas	(SW)	956	347
Raised Floor Area:	656	(NW)	2,557	330
Slab on Grade Area:	2,115	(NE)	454	113
Average Ceiling Height:	10.2	Roof	2,767	26
Fenestration Average U-Factor:	0.57	TOTAL:		1,104
Average SHGC:	0.36	Fenestration/CFA Ratio:		19.9 %

REMARKS

BASE CASE: Less than 12' of ducts are in unconditioned space. Furnace is an 80% AFUE unit. Retaining Walls in basement are insulated. West Facing Glazing is monolithic. Quality Insulation Installation & Duct Testing has been specified - These measures require verification by a certified HERS Rater. R-30 Floor Insulation has been specified.

15% Case:

ECM-3 - Wall Insulation Upgrade: R-13 to R-19 Wall Batts: 9.1%;

ECM-8 - Furnace upgrade - AFUE 80% to 95%: 9.4%

ECM-11 - Low Leakage Ducts in Conditioned Space: HERS Already required in Base Case: Cost = \$0.0): 4.1%;

ECM-13 - Eliminate three 6.3 sf skylights: 3.1%.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Company *NEWTON ENERGY*

Address *1401 19th Street*

City/State/Zip *Manhattan Beach, CA 90266*

Name *Rick Newton*

Phone *310 375-2699*



10/20/2010

Signed

Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company *Sexton Homes*

Address *PO Box 1795*

City/State/Zip *Manhattan Beach, CA 90267*

Name

Phone *(310) 545-3432*

Signed

License #

Date

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name The Strand SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/20/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	510	0.036	R-30				251	1	New	4.2.2-A16	2nd Floor Zone
Roof	496	0.036	R-30				341	1	New	4.2.2-A16	2nd Floor Zone
Roof	482	0.036	R-30				71	1	New	4.2.2-A16	2nd Floor Zone
Roof	502	0.036	R-30				161	1	New	4.2.2-A16	2nd Floor Zone
Floor	598	0.034	R-30				0	180	New	4.4.2-A7	2nd Floor Zone
Wall	275	0.074	R-19				251	90	New	4.3.1-A5	2nd Floor Zone
Wall	873	0.074	R-19				341	90	New	4.3.1-A5	2nd Floor Zone
Wall	252	0.074	R-19				71	90	New	4.3.1-A5	2nd Floor Zone
Wall	843	0.074	R-19				161	90	New	4.3.1-A5	2nd Floor Zone
Floor	58	0.034	R-30				0	180	New	4.4.2-A7	1st Floor Zone
Wall	182	0.074	R-19				251	90	New	4.3.1-A5	1st Floor Zone
Wall	494	0.074	R-19				341	90	New	4.3.1-A5	1st Floor Zone
Wall	123	0.074	R-19				0	90	New	4.3.1-A5	1st Floor Zone
Door	23	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	89	0.074	R-19				71	90	New	4.3.1-A5	1st Floor Zone
Wall	593	0.074	R-19				161	90	New	4.3.1-A5	1st Floor Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
1	Skylight	0.0	0.370 NFRC	0.29 NFRC	251	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
2	Skylight	6.3	0.370 NFRC	0.29 NFRC	341	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
3	Skylight	20.0	0.370 NFRC	0.29 NFRC	71	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
4	Skylight	0.0	0.370 NFRC	0.29 NFRC	161	New	Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
5	Window	88.0	0.930 COG	0.44 COG	251	New	PPG Azuria Mono.Non-Metal D/	2nd Floor Zone
6	Window	98.0	0.370 NFRC	0.32 NFRC	341	New	IWC 5300 Vinyl/Low-E	2nd Floor Zone
7	Window	65.0	0.370 NFRC	0.32 NFRC	71	New	IWC 5300 Vinyl/Low-E	2nd Floor Zone
8	Window	150.0	0.370 NFRC	0.32 NFRC	161	New	IWC 5300 Vinyl/Low-E	2nd Floor Zone
9	Window	125.0	0.930 COG	0.44 COG	251	New	PPG Azuria Mono.Non-Metal D/	1st Floor Zone
10	Window	110.0	0.370 NFRC	0.32 NFRC	341	New	IWC 5300 Vinyl/Low-E	1st Floor Zone
11	Window	36.0	0.340 NFRC	0.33 NFRC	71	New	Andersen Permashield	1st Floor Zone
12	Window	12.0	0.370 NFRC	0.32 NFRC	71	New	IWC 5300 Vinyl/Low-E	1st Floor Zone
13	Window	60.0	0.370 NFRC	0.32 NFRC	161	New	IWC 5300 Vinyl/Low-E	1st Floor Zone
14	Window	134.0	0.930 COG	0.44 COG	251	New	PPG Azuria Mono.Non-Metal D/	Basement Zone
15	Window	122.0	0.370 NFRC	0.32 NFRC	341	New	IWC 5300 Vinyl/Low-E	Basement Zone
16	Window	78.0	0.370 NFRC	0.32 NFRC	161	New	IWC 5300 Vinyl/Low-E	Basement Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	None	1.00												
3	None	1.00												
4	None	1.00												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76												
16	Bug Screen	0.76												

Project Name
The Strand SFR (15%) All ECM's

Building Type	<input checked="" type="checkbox"/> Single Family	<input type="checkbox"/> Addition Alone
	<input type="checkbox"/> Multi Family	<input type="checkbox"/> Existing+ Addition/Alteration

Date
10/20/2010

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation					Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior	Frame					
Roof	751	0.035	R-30					71	1	New	4.2.2-A17	Basement Zone
Slab	2,115	0.730	None					0	180	New	4.4.7-A1	Basement Zone
Wall	152	0.074	R-19					251	90	New	4.3.1-A5	Basement Zone
Wall	454	0.074	R-19					341	90	New	4.3.1-A5	Basement Zone
Wall	287	0.074	R-19					161	90	New	4.3.1-A5	Basement Zone
Wall	260	0.074	R-19					0	90	New	4.3.1-A5	Basement Zone
WallBG	80	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	19	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	12	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	70	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	51	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	35	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	56	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	63	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	14	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	50	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone

FENESTRATION SURFACE DETAILS

[illegible]

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

[illegible]

CF-1R

10/20/2010

[illegible][illegible]

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

[illegible]

CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) **CF-1R**

Project Name The Strand SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/20/2010
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BUILDING ZONE INFORMATION

System Name	Zone Name	Floor Area (ft ²)				Volume	Year Built
		New	Existing	Altered	Removed		
Whole House Systems	2nd Floor	2,008				19,277	
	1st Floor	1,428				14,708	
	Basement	2,115				22,419	
Totals		5,551	0	0	0		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
Whole House Systems	2	Central Furnace	95% AFUE	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
Whole House Systems	Ducted	Ducted	Conditioned	4.2	<input type="checkbox"/>	New
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

WATER HEATING SYSTEMS

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
A O Smith Water Products	1	Small Gas	Kitchen Pipe Ins	55,000	75	0.57	n/a	n/a	New

MULTI-FAMILY WATER HEATING DETAILS

HYDRONIC HEATING SYSTEM PIPING

Control			Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
	Qty.	HP	<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name The Strand SFR (15%) All ECM's		Date 10/20/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			
<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-20T08:24:28 ID: 7273R Page 10 of 14 </div>			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name The Strand SFR (15%) All ECM's		Date 10/20/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft2 or 100 watts for dwelling units larger than 2,500 ft2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-20T08:24:28 ID: 7273R Page 11 of 14			

MANDATORY MEASURES SUMMARY: Residential**(Page 3 of 3)****MF-1R**

Project Name

The Strand SFR (15%) All ECM's

Date

10/20/2010

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on. EXCEPTION 2: Outdoor luminaires used to comply with Exception 1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

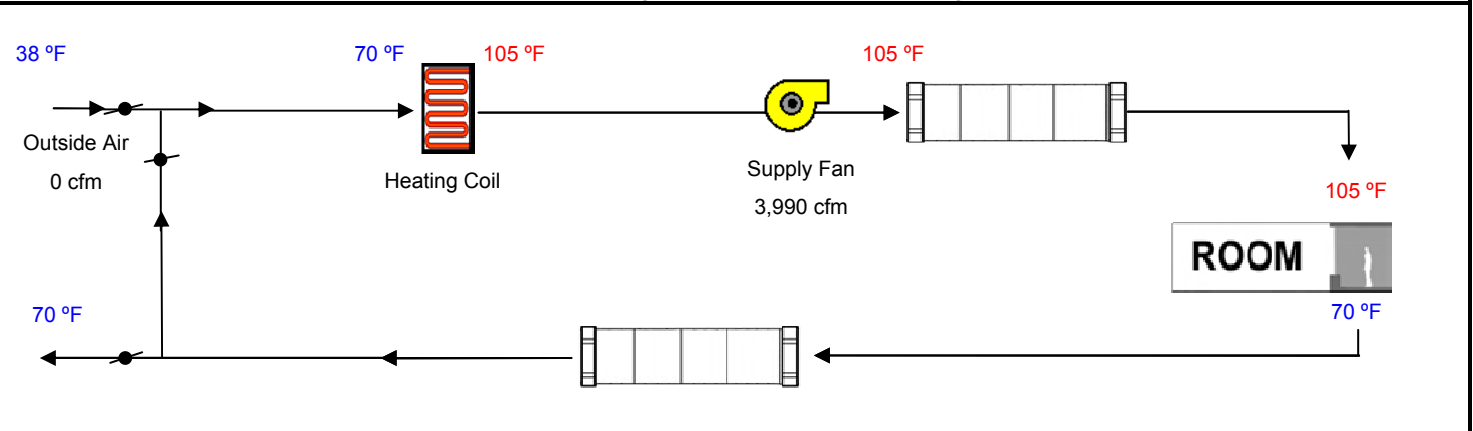
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name The Strand SFR (15%) All ECM's	Date 10/20/2010
System Name Whole House Systems	Floor Area 5,551

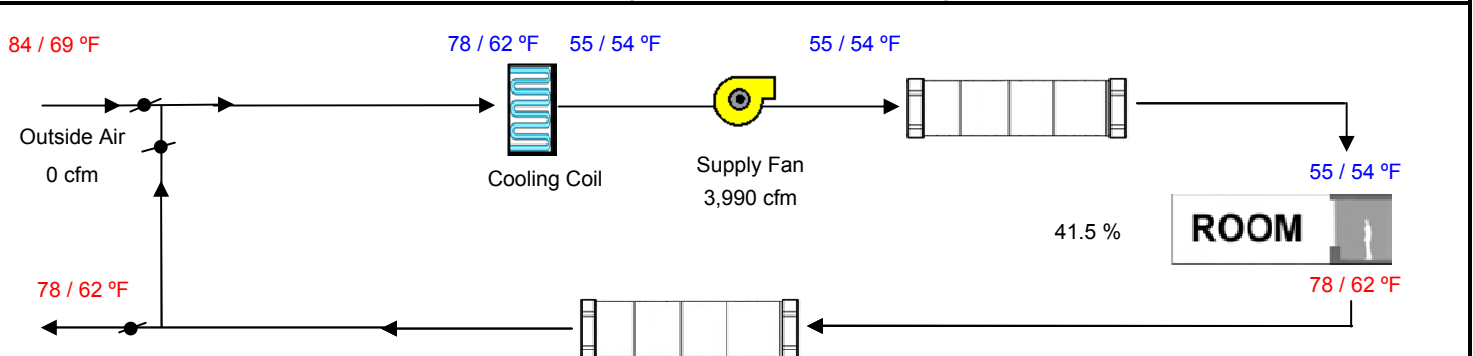
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	2	Total Room Loads Return Vented Lighting Return Air Ducts Return Fan Ventilation Supply Fan Supply Air Ducts TOTAL SYSTEM LOAD	COIL COOLING PEAK			COIL HTG. PEAK
Heating System			CFM	Sensible	Latent	CFM
Output per System	38,000		1,963	48,546	3,373	1,508
Total Output (Btuh)	76,000			0		
Output (Btuh/sqft)	13.7			0		0
Cooling System				0		0
Output per System	0		0	0	0	0
Total Output (Btuh)	0			0		0
Total Output (Tons)	0.0			0		0
Total Output (Btuh/sqft)	0.0			0		0
Total Output (sqft/Ton)	0.0			48,546	3,373	56,761

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. 58MXB040-12x				
Airflow (cfm)	3,990		0	0		76,000
Airflow (cfm/sqft)	0.72					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output		0	0	76,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)				
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK		Aug 3 PM	Jan 1 AM	

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



ENERGY USE AND COST SUMMARY

ECON-1

Project Name
The Strand SFR (15%) All ECM's

Date
10/20/2010

Rate: SCE GS-1

Fuel Type: Electricity

	STANDARD			PROPOSED			MARGIN		
	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)
Jan	110	2	26	91	1	25	18	0	1
Feb	118	6	26	86	5	24	32	1	2
Mar	96	4	25	75	1	24	21	3	1
Apr	86	5	24	66	5	23	20	0	1
May	34	1	22	32	1	22	3	0	0
Jun	79	8	24	74	8	24	5	0	0
Jul	48	8	23	42	7	22	7	1	0
Aug	56	7	23	49	7	23	6	1	0
Sep	135	9	27	105	7	25	30	1	1
Oct	41	8	22	33	6	22	8	2	0
Nov	64	4	23	54	4	23	10	0	0
Dec	147	7	27	115	6	26	32	1	2
Year	1,014	9	293	822	8	283	191	1	9
CO ₂	816	lbs/yr		662	lbs/yr		154	lbs/yr	

Rate: SoCal GN-10

Fuel Type: Natural Gas

	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)
Jan	90	127	30	67	94	22	23	33	8
Feb	71	118	23	54	84	18	17	34	6
Mar	74	105	24	57	75	19	17	30	5
Apr	49	95	16	41	70	14	8	25	3
May	34	89	11	31	65	10	4	24	1
Jun	21	6	7	21	6	7	0	0	0
Jul	22	6	7	22	6	7	0	0	0
Aug	21	6	7	22	6	7	0	0	0
Sep	21	6	7	21	6	7	0	0	0
Oct	22	28	7	22	18	7	0	10	0
Nov	47	108	15	39	81	13	7	28	2
Dec	97	125	32	72	89	24	24	37	8
Year	568	127	187	469	94	154	99	33	32
CO ₂	6,648	lbs/yr		5,493	lbs/yr		1,156	lbs/yr	

Annual Totals	Energy	Demand	Cost	Cost/sqft	Virtual Rate
Electricity	822 kWh	8 kW	\$ 283	\$ 0.05 /sqft	\$ 0.34 /kWh
Natural Gas	469 therms	94 kBtu/hr	\$ 154	\$ 0.03 /sqft	\$ 0.33 /therm
		Total	\$ 437	\$ 0.08 /sqft	

Avoided CO₂ Emissions: 1,310 lbs/yr

LIFE CYCLE COSTING SUMMARY

LCC-1

Project Name

LLC for The Strand SFR 15% - Skylt. Downgrade

Date

10/20/2010

ANNUAL ENERGY USE AND COST

Option	Description	Electricity			Natural Gas		Simple Payback (years)
		Consumption (kWh)	Demand (kW)	Cost (\$)	Consumption (therms)	Cost (\$)	
Base	The Strand SFR BASE CASE	994	9	\$292	573	\$188	N/A
1	ECM-3 - Wall Insul. Upgrade to R-19: 9.1%	893	9	\$287	521	\$171	6.9
2	ECM-8 - Furnace upgrade (2)-AFUE 80%-95%: 9	966	9	\$290	513	\$169	56.9
3	ECM-11 - Low Leak. Ducts in Cond. Space: 4.1%	935	8	\$289	552	\$182	0.0
4	ECM-13 - Eliminate (Downgrade) 3 Skylights	956	9	\$290	556	\$183	N/A
5	TOTLA: The Strand SFR (15%) All ECM's:	819	8	\$283	455	\$150	19.1

LIFE CYCLE COST PRESENT VALUE

Option	Initial Cost	Utility Incentive	Annual Recurring Costs	Electricity Costs	Natural Gas Costs	Non Annual Recurring OM&R Cost	Replacem. Costs	Residual Value	Total LCC	Savings
Base	\$0	\$0	\$0	\$5,763	\$4,577	\$0	\$0	\$0	\$10,341	\$0
1	\$150	\$0	\$0	\$5,665	\$4,168	\$0	\$0	\$0	\$9,983	\$357
2	\$1,200	\$0	\$0	\$5,736	\$4,098	\$0	\$0	\$0	\$11,034	(\$693)
3	\$0	\$0	\$0	\$5,706	\$4,416	\$0	\$0	\$0	\$10,122	\$219
4	(\$1,350)	\$0	\$0	\$5,726	\$4,446	\$0	\$0	\$0	\$8,823	\$1,518
5	\$900	\$0	\$0	\$5,594	\$3,638	\$0	\$0	\$0	\$10,132	\$209

Study Parameters

Study Period: 30 years

Real Discount Rate: 3.0 %

☒ DOE/FEMP Escalation Rates

Region: Western US

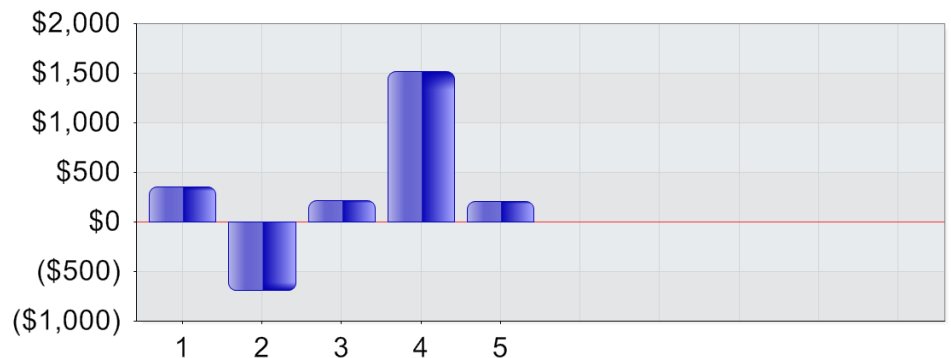
Fuel Sector: Commercial

☐ Uniform Escalation Rates

Electricity: N/A

Natural Gas: N/A

LIFE CYCLE COST SAVINGS



BUILDING ENERGY ANALYSIS REPORT

PROJECT:

East Manhattan SFR (1.1%) BASE CASE
1647 Mathews Avenue
Manhattan Beach, CA 90266

Project Designer:

2100 N. Sepulveda Blvd., #11
Manhattan Beach, CA 90266
(310) 379-5867

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

8152R

Date:

10/13/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

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Form MF-1R Mandatory Measures Summary	9
HVAC System Heating and Cooling Loads Summary	12

PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)		CF-1R	
Project Name East Manhattan SFR (1.1%) BASE CASE			Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration				Date 10/13/2010		
Project Address 1647 Mathews Avenue Manhattan Beach			California Energy Climate Zone CA Climate Zone 06		Total Cond. Floor Area 3,137		Addition n/a		# of Stories 2
FIELD INSPECTION ENERGY CHECKLIST <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.									
INSULATION									
Construction		Type	Cavity	Area (ft²)	Special Features (see Part 2 of 5)			Status	
Floor	Wood Framed w/o Crawl Space		R-19	404				New	
Roof	Wood Framed Rafter		R-30	1,880				New	
Wall	Wood Framed		R-13	2,707				New	
Slab	Unheated Slab-on-Grade		None	1,512	Perim = 160'			New	
Door	Opaque Door		None	21				New	
FENESTRATION									
Orientation	Area(ft²)	U-Factor	SHGC	Overhang	Sidefins	Exterior Shades	Status		
Skylight	36.0	0.390	0.29	none	none	None	New		
Rear (N)	181.5	0.330	0.31	none	none	Bug Screen	New		
Front (S)	183.4	0.330	0.31	none	none	Bug Screen	New		
Right (E)	46.7	0.330	0.31	none	none	Bug Screen	New		
Left (W)	68.0	0.330	0.31	none	none	Bug Screen	New		
Front (S)	84.0	0.330	0.31	6.0	none	Bug Screen	New		
Right (E)	17.5	0.330	0.31	11.0	none	Bug Screen	New		
Right (E)	16.0	0.330	0.31	3.5	none	Bug Screen	New		
Left (W)	20.0	0.330	0.31	3.0	none	Bug Screen	New		
HVAC SYSTEMS									
Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status			
1	Central Furnace	90% AFUE	No Cooling	13.0 SEER	Setback	New			
HVAC DISTRIBUTION									
Location	Heating	Cooling	Duct Location	Duct R-Value	Status				
Whole House System	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	New				
WATER HEATING									
Qty.	Type	Gallons	Min. Eff	Distribution	Status				
1	Small Gas	75	0.58	Kitchen Pipe Ins	New				
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-13T07:27:51 ID: 8152R Page 3 of 12									

PERFORMANCE CERTIFICATE: Residential	(Part 2 of 5)	CF-1R
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Project Name <i>East Manhattan SFR (1.1%) BASE CASE</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/13/2010</i>
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SPECIAL FEATURES INSPECTION CHECKLIST

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

The HVAC System CARRIER 58MSA060-12 does not include a cooling system, field verification is not necessary.

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name East Manhattan SFR (1.1%) BASE CASE	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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ANNUAL ENERGY USE SUMMARY

TDV (kBtu/ft ² -yr)	Standard	Proposed	Margin
Space Heating	7.68	8.27	-0.59
Space Cooling	1.27	0.55	0.72
Fans	1.92	1.91	0.01
Domestic Hot Water	12.31	12.21	0.11
Pumps	0.00	0.00	0.00
Totals	23.19	22.94	0.25
Percent Better Than Standard:		1.1 %	

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

		Ext. Walls/Roof	Wall Area	Fenestration Area
Building Front Orientation:	(S) 180 deg	(S)	594	267
Number of Dwelling Units:	1.00	(W)	1,025	88
Fuel Available at Site:	Natural Gas	(N)	853	182
Raised Floor Area:	404	(E)	873	80
Slab on Grade Area:	1,512	Roof	1,916	36
Average Ceiling Height:	9.3			
Fenestration Average U-Factor:	0.33		TOTAL:	653
Average SHGC:	0.31		Fenestration/CFA Ratio:	20.8 %

REMARKS

BASE CASE: No R-19 Ceilings. Wall Fenestration U-Factor = 0.33, SHGC = 0.31. Gas Furnace w/ AFUE = 90%, no cooling - assumed SEER = 13.0.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation AuthorCompany **NEWTON ENERGY**Address **1401 19th Street**Name **Rick Newton**City/State/Zip **Manhattan Beach, CA 90266**Phone **310 375-2699****10/13/2010**

Signed

Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company

Address **2100 N. Sepulveda Blvd., #11**Name **Robert Treman Architecture**City/State/Zip **Manhattan Beach, CA 90266**Phone **(310) 379-5867**

Signed

License #

Date

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name East Manhattan SFR (1.1%) BASE CASE	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Floor	404	0.048	R-19				0	180	New	4.4.2-A4	2nd Floor Zone
Roof	1,589	0.035	R-30				30	24	New	4.2.2-A17	2nd Floor Zone
Wall	229	0.102	R-13				0	90	New	4.3.1-A3	2nd Floor Zone
Wall	194	0.102	R-13				180	90	New	4.3.1-A3	2nd Floor Zone
Wall	393	0.102	R-13				90	90	New	4.3.1-A3	2nd Floor Zone
Wall	372	0.102	R-13				270	90	New	4.3.1-A3	2nd Floor Zone
Slab	1,512	0.730	None				0	180	New	4.4.7-A1	1st Floor Zone
Roof	291	0.035	R-30				30	24	New	4.2.2-A17	1st Floor Zone
Wall	122	0.102	R-13				0	90	New	4.3.1-A3	1st Floor Zone
Door	21	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	300	0.102	R-13				0	90	New	4.3.1-A3	1st Floor Zone
Wall	133	0.102	R-13				180	90	New	4.3.1-A3	1st Floor Zone
Wall	400	0.102	R-13				90	90	New	4.3.1-A3	1st Floor Zone
Wall	565	0.102	R-13				270	90	New	4.3.1-A3	1st Floor Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
1	Skylight	36.0	0.390 NFRC	0.29 NFRC	30	New	Velux Comfort+(74) Lowe2/Arg	2nd Floor Zone
2	Window	48.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
3	Window	32.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
4	Window	13.4	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
5	Window	48.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
6	Window	54.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
7	Window	6.7	0.330 NFRC	0.31 NFRC	90	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
8	Window	40.0	0.330 NFRC	0.31 NFRC	90	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
9	Window	30.0	0.330 NFRC	0.31 NFRC	270	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
10	Window	38.0	0.330 NFRC	0.31 NFRC	270	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
11	Window	17.5	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
12	Window	64.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
13	Window	20.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
14	Window	68.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
15	Window	84.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
16	Window	17.5	0.330 NFRC	0.31 NFRC	90	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76	8.0	6.5	6.0	0.1	6.0	6.0						
16	Bug Screen	0.76	5.0	3.5	11.0	0.1	6.0	6.0						

CF-1R

10/13/2010

[illegible][illegible]

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

[illegible]

CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) **CF-1R**

Project Name East Manhattan SFR (1.1%) BASE CASE	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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BUILDING ZONE INFORMATION

System Name	Zone Name	Floor Area (ft ²)				Volume	Year Built
		New	Existing	Altered	Removed		
Whole House System	Second Floor	1,625				14,625	
	First Floor	1,512				14,515	
Totals		3,137	0	0	0		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
Whole House System	1	Central Furnace	90% AFUE	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
Whole House System	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	New
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

WATER HEATING SYSTEMS

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
A O Smith Water Products	1	Small Gas	Kitchen Pipe Ins	70,000	75	0.58	n/a	n/a	New

MULTI-FAMILY WATER HEATING DETAILS

HYDRONIC HEATING SYSTEM PIPING

Control			Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
	Qty.	HP	<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name East Manhattan SFR (1.1%) BASE CASE		Date 10/13/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name East Manhattan SFR (1.1%) BASE CASE		Date 10/13/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft2 or 100 watts for dwelling units larger than 2,500 ft2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-13T07:27:51 ID: 8152R Page 10 of 12			

Date

10/13/2010

\$150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

\$150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. **EXCEPTION 1:** Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-occupant sensor that complies with the applicable requirements of §119. **EXCEPTION 2:** Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

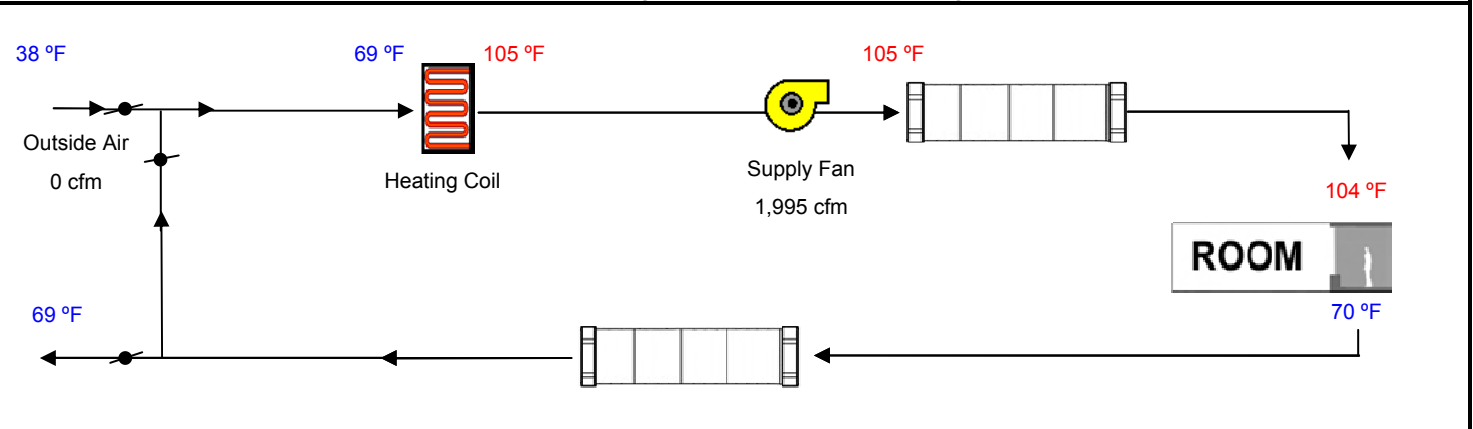
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name East Manhattan SFR (1.1%) BASE CASE	Date 10/13/2010
System Name Whole House System	Floor Area 3,137

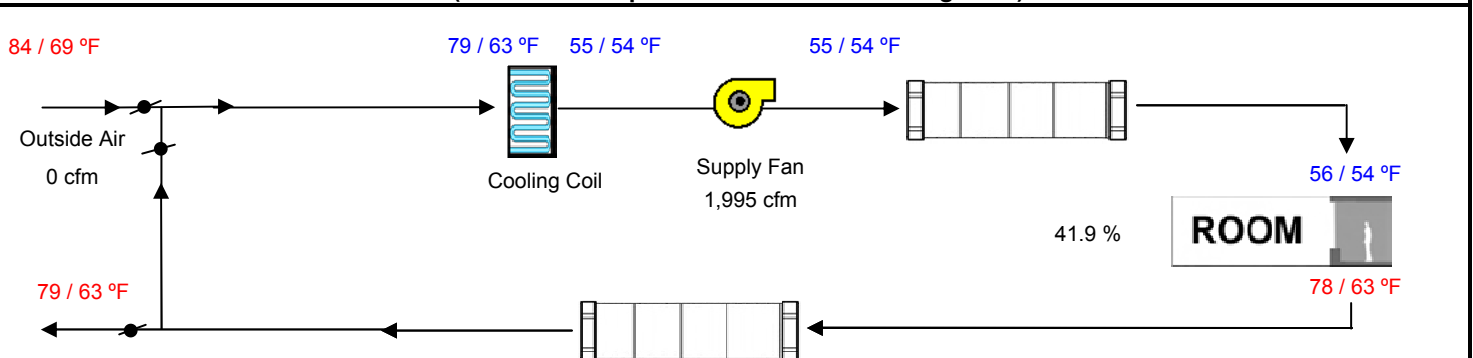
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	1	Total Room Loads Return Vented Lighting Return Air Ducts Return Fan Ventilation Supply Fan Supply Air Ducts TOTAL SYSTEM LOAD	COIL COOLING PEAK			COIL HTG. PEAK
Heating System			CFM	Sensible	Latent	CFM
Output per System	55,000		1,038	25,080	2,592	818
Total Output (Btuh)	55,000			0		
Output (Btuh/sqft)	17.5			1,125		1,468
Cooling System				0		0
Output per System	0		0	0	0	0
Total Output (Btuh)	0			0		0
Total Output (Tons)	0.0			1,125		1,468
Total Output (Btuh/sqft)	0.0					
Total Output (sqft/Ton)	0.0			27,329	2,592	33,126

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	CARRIER 58MSA060-12				
Airflow (cfm)	1,995		0	0		55,000
Airflow (cfm/sqft)	0.64					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output		0	0	55,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)				
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK		Aug 3 PM	Jan 1 AM	

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



BUILDING ENERGY ANALYSIS REPORT

PROJECT:

East Manhattan SFR (15%) All ECM's
1647 Mathews Avenue
Manhattan Beach, CA 90266

Project Designer:

2100 N. Sepulveda Blvd., #11
Manhattan Beach, CA 90266
(310) 379-5867

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

8152R

Date:

10/16/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

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HVAC System Heating and Cooling Loads Summary	12

PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)		CF-1R																																																																																																	
Project Name <i>East Manhattan SFR (15%) All ECM's</i>			Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration				Date <i>10/16/2010</i>																																																																																																		
Project Address <i>1647 Mathews Avenue Manhattan Beach</i>			California Energy Climate Zone <i>CA Climate Zone 06</i>		Total Cond. Floor Area <i>3,137</i>		Addition <i>n/a</i>		# of Stories <i>2</i>																																																																																																
FIELD INSPECTION ENERGY CHECKLIST <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.																																																																																																									
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EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:47:47 ID: 8152R Page 3 of 12																																																																																																									

CF-1R

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name <i>East Manhattan SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
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ANNUAL ENERGY USE SUMMARY

TDV (kBtu/ft ² -yr)	Standard	Proposed	Margin
Space Heating	8.10	5.62	2.48
Space Cooling	1.20	0.32	0.88
Fans	1.94	1.57	0.37
Domestic Hot Water	12.31	12.21	0.11
Pumps	0.00	0.00	0.00
Totals	23.56	19.72	3.84
Percent Better Than Standard:			16.3 %

BUILDING COMPLIES - HERS VERIFICATION REQUIRED

Building Front Orientation:	(S) 180 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	1.00	(S)	594	273
Fuel Available at Site:	Natural Gas	(W)	1,025	88
Raised Floor Area:	404	(N)	853	182
Slab on Grade Area:	1,512	(E)	873	80
Average Ceiling Height:	9.3	Roof	1,916	36
Fenestration Average U-Factor:	0.33		TOTAL:	659
Average SHGC:	0.31		Fenestration/CFA Ratio:	21.0 %

REMARKS

BASE CASE: No R-19 Ceilings. Wall Fenestration U-Factor = 0.33, SHGC = 0.31. Gas Furnace w/ AFUE = 92%, no cooling.

15% CASE - All ECM's:

ECM-6 - Quality Insulation - HERS field verification is required: 6.6%.

ECM-11 - Low Leakage Ducts in Conditioned Space: 12.4%.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Company *NEWTON ENERGY*

Address *1401 19th Street*

Name *Rick Newton*

City/State/Zip *Manhattan Beach, CA 90266*

Phone *310 375-2699*



10/16/2010

Signed

Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company

Address *2100 N. Sepulveda Blvd., #11*

Name *Robert Treman Architecture*

City/State/Zip *Manhattan Beach, CA 90266*

Phone *(310) 379-5867*

Signed

License #

Date

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name East Manhattan SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Floor	404	0.048	R-19				0	180	New	4.4.2-A4	2nd Floor Zone
Roof	1,589	0.035	R-30				30	24	New	4.2.2-A17	2nd Floor Zone
Wall	229	0.102	R-13				0	90	New	4.3.1-A3	2nd Floor Zone
Wall	188	0.102	R-13				180	90	New	4.3.1-A3	2nd Floor Zone
Wall	393	0.102	R-13				90	90	New	4.3.1-A3	2nd Floor Zone
Wall	372	0.102	R-13				270	90	New	4.3.1-A3	2nd Floor Zone
Slab	1,512	0.730	None				0	180	New	4.4.7-A1	1st Floor Zone
Roof	291	0.035	R-30				30	24	New	4.2.2-A17	1st Floor Zone
Wall	122	0.102	R-13				0	90	New	4.3.1-A3	1st Floor Zone
Door	21	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	300	0.102	R-13				0	90	New	4.3.1-A3	1st Floor Zone
Wall	133	0.102	R-13				180	90	New	4.3.1-A3	1st Floor Zone
Wall	400	0.102	R-13				90	90	New	4.3.1-A3	1st Floor Zone
Wall	565	0.102	R-13				270	90	New	4.3.1-A3	1st Floor Zone

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
1	Skylight	36.0	0.390 NFRC	0.29 NFRC	30	New	Velux Comfort+(74) Lowe2/Arg	2nd Floor Zone
2	Window	48.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
3	Window	32.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
4	Window	13.4	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
5	Window	48.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
6	Window	60.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
7	Window	6.7	0.330 NFRC	0.31 NFRC	90	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
8	Window	40.0	0.330 NFRC	0.31 NFRC	90	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
9	Window	30.0	0.330 NFRC	0.31 NFRC	270	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
10	Window	38.0	0.330 NFRC	0.31 NFRC	270	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
11	Window	64.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
12	Window	20.0	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
13	Window	17.5	0.330 NFRC	0.31 NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
14	Window	68.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
15	Window	84.0	0.330 NFRC	0.31 NFRC	180	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
16	Window	17.5	0.330 NFRC	0.31 NFRC	90	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76	8.0	10.5	6.0	0.1	6.0	6.0						
16	Bug Screen	0.76	5.0	3.5	11.0	0.1	6.0	6.0						

CF-1R

10/16/2010

[illegible][illegible]

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

[illegible]

CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) **CF-1R**

Project Name East Manhattan SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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BUILDING ZONE INFORMATION

System Name	Zone Name	Floor Area (ft ²)				Volume	Year Built
		New	Existing	Altered	Removed		
Whole House System	Second Floor (1,625 sf)	1,625				14,625	
	First Floor	1,512				14,515	
Totals		3,137	0	0	0		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
Whole House System	1	Central Furnace	92% AFUE	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
Whole House System	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	New
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

WATER HEATING SYSTEMS

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
A O Smith Water Products	1	Small Gas	Kitchen Pipe Ins	70,000	75	0.58	n/a	n/a	New

MULTI-FAMILY WATER HEATING DETAILS

HYDRONIC HEATING SYSTEM PIPING

Control	Qty.		HP	Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
					Plenum	Outside	Buried					
				<input type="checkbox"/>				<input type="checkbox"/>				
				<input type="checkbox"/>				<input type="checkbox"/>				
				<input type="checkbox"/>				<input type="checkbox"/>				
				<input type="checkbox"/>				<input type="checkbox"/>				
				<input type="checkbox"/>				<input type="checkbox"/>				

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name East Manhattan SFR (15%) All ECM's		Date 10/16/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			
<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:47:47 ID: 8152R Page 9 of 12 </div>			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name East Manhattan SFR (15%) All ECM's		Date 10/16/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft ² or 100 watts for dwelling units larger than 2,500 ft ² may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:47:47 ID: 8152R Page 10 of 12			

Date _____

10/16/2010

\$150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

\$150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. **EXCEPTION 1:** Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-occupant sensor that complies with the applicable requirements of §119. **EXCEPTION 2:** Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

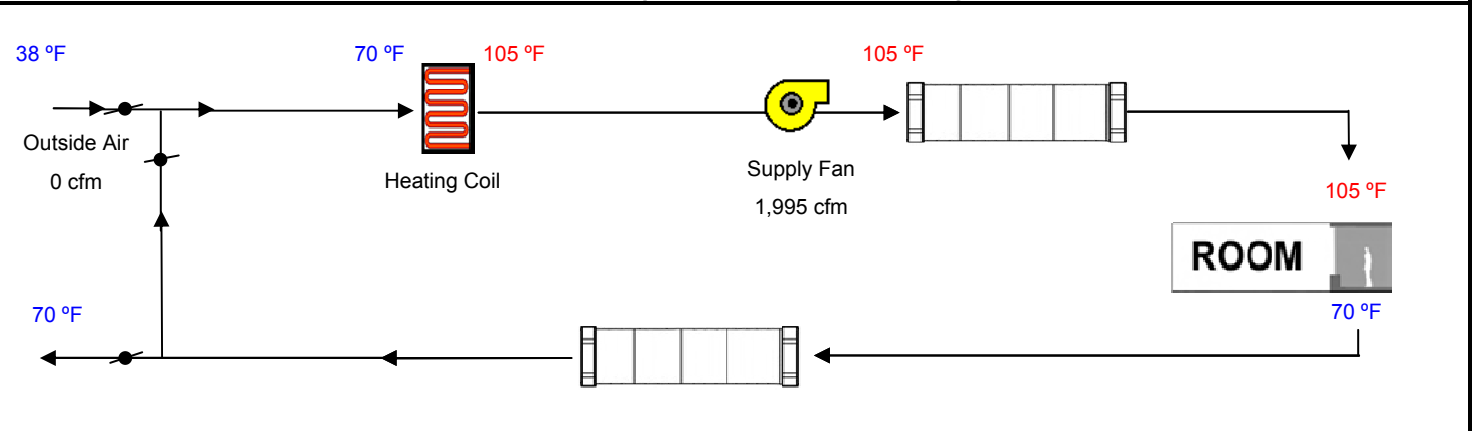
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name East Manhattan SFR (15%) All ECM's	Date 10/16/2010
System Name Whole House System	Floor Area 3,137

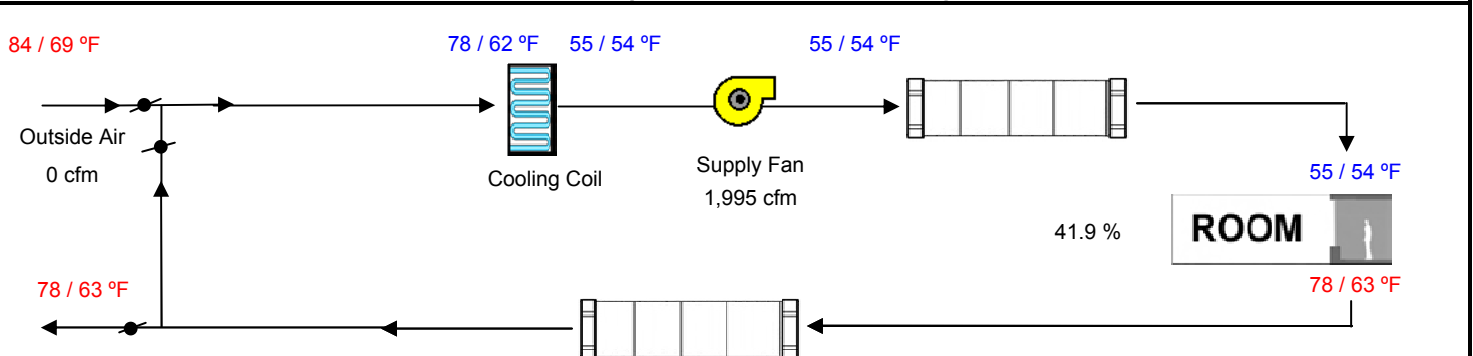
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	1	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System		CFM	Sensible	Latent	CFM	Sensible
Output per System	55,000	1,013	25,056	2,477	780	29,353
Total Output (Btuh)	55,000		0			
Output (Btuh/sqft)	17.5		0			0
			0			0
Cooling System						
Output per System	0	0	0	0	0	0
Total Output (Btuh)	0		0			0
Total Output (Tons)	0.0		0			0
Total Output (Btuh/sqft)	0.0		0			0
Total Output (sqft/Ton)	0.0	TOTAL SYSTEM LOAD				29,353
			25,056	2,477		

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. N9MPD060F12				55,000
Airflow (cfm)	1,995		0	0		
Airflow (cfm/sqft)	0.64					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output				55,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)				
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK			Aug 3 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



LIFE CYCLE COSTING SUMMARY

LCC-1

Project Name

LCC for East Manhattan SFR to 15% - 2 year

Date

10/19/2010

ANNUAL ENERGY USE AND COST

Option	Description	Electricity			Natural Gas		Simple Payback (years)
		Consumption (kWh)	Demand (kW)	Cost (\$)	Consumption (therms)	Cost (\$)	
Base	East Manhattan SFR BASE CASE	521	4	\$691	419	\$138	N/A
1	ECM-6 - Quality Insulation - HERS: 6.6%	481	4	\$666	408	\$134	5.1
2	ECM-11 - Low Leak. Ducts in Cond. Space: 12.4%	455	3	\$265	397	\$131	0.8
3	TOTAL: East Manhattan SFR (20%) All ECM's	481	4	\$266	340	\$112	1.4

LIFE CYCLE COST PRESENT VALUE

Option	Initial Cost	Utility Incentive	Annual Recurring Costs	Electricity Costs	Natural Gas Costs	Non Annual Recurring OM&R Cost	Replacem. Costs	Residual Value	Total LCC	Savings
Base	\$0	\$0	\$0	\$1,323	\$292	\$0	\$0	\$0	\$1,615	\$0
1	\$150	\$0	\$0	\$1,273	\$284	\$0	\$0	\$0	\$1,708	(\$93)
2	\$350	\$0	\$0	\$507	\$277	\$0	\$0	\$0	\$1,134	\$481
3	\$625	\$0	\$0	\$509	\$237	\$0	\$0	\$0	\$1,372	\$243

Study Parameters

Study Period: 2 years

Real Discount Rate: 3.0 %

☒ DOE/FEMP Escalation Rates

Region: Western US

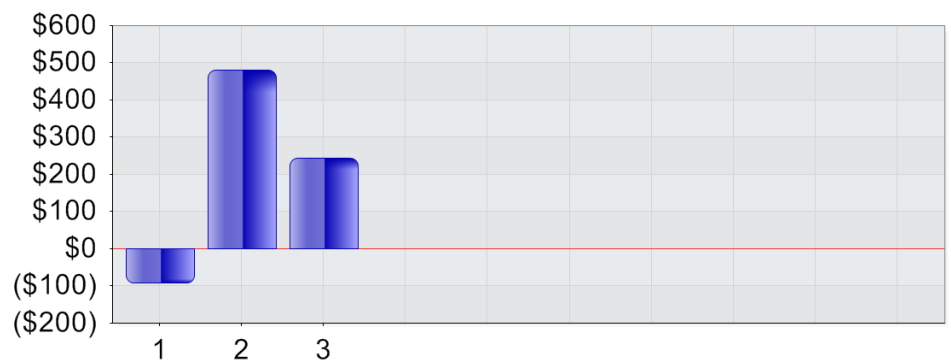
Fuel Sector: Commercial

☐ Uniform Escalation Rates

Electricity: N/A

Natural Gas: N/A

LIFE CYCLE COST SAVINGS



BUILDING ENERGY ANALYSIS REPORT

PROJECT:

East Manhattan E+A SFR (4.3%) BASE CASE
1516 Ruhland Avenue
Manhattan Beach, CA 90266

Project Designer:

2100 N. Sepulveda Blvd. #11
Manhattan Beach, CA 90266
(310) 379-8567

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

8360P

Date:

10/13/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

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Project Address <i>1516 Ruhland Avenue Manhattan Beach</i>			California Energy Climate Zone <i>CA Climate Zone 06</i>		Total Cond. Floor Area <i>2,742</i>		Addition <i>310</i>		# of Stories <i>2</i>																																																																																																																								
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EnergyPro 5.1 by EnergySoft	User Number: 2100	RunCode: 2010-10-11T19:36:00	ID: 8360P	Page 4 of 13
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PERFORMANCE CERTIFICATE: Residential	(Part 2 of 5)	CF-1R
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Project Name <i>East Manhattan E+A SFR (4.3%) BASE CA</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/13/2010</i>
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SPECIAL FEATURES INSPECTION CHECKLIST

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

The HVAC System Existing 80% Furnace Assumed does not include a cooling system, field verification is not necessary.

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name East Manhattan E+A SFR (4.3%) BASE CASE	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date 10/13/2010
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ANNUAL ENERGY USE SUMMARY

	Standard	Proposed	Margin
TDV (kBtu/ft ² -yr)			
Space Heating	34.96	32.83	2.13
Space Cooling	16.34	15.62	0.72
Fans	8.90	8.50	0.40
Domestic Hot Water	15.31	15.31	0.00
Pumps	0.00	0.00	0.00
Totals	75.50	72.25	3.25
Percent Better Than Standard:			4.3 %

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

			Ext. Walls/Roof	Wall Area	Fenestration Area
Building Front Orientation:	(N) 0 deg				
Number of Dwelling Units:	1.00		(N)	683	65
Fuel Available at Site:	Natural Gas		(E)	855	57
Raised Floor Area:	1,975		(S)	807	281
Slab on Grade Area:	0		(W)	946	119
Average Ceiling Height:	8.1		Roof	1,975	15
Fenestration Average U-Factor:	0.55			TOTAL:	536
Average SHGC:	0.67			Fenestration/CFA Ratio:	19.6 %

REMARKS

BASE CASE (4.3%): Assuming existing & new fenestration is Double Non-Metal Clear. Standard Gas 50 gal or Less water heater.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation AuthorCompany **NEWTON ENERGY**Address **1401 19th Street**Name **Rick Newton**City/State/Zip **Manhattan Beach, CA 90266**Phone **310 375-2699****10/13/2010**

Signed

Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company

Address **2100 N. Sepulveda Blvd. #11**Name **Robert Treman Architecture**City/State/Zip **Manhattan Beach, CA 90266**Phone **(310) 379-8567**

Signed

License #

Date

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name **East Manhattan E+A SFR (4.3%) BASE CAS** Building Type ☒ Single Family ☐ Addition Alone
☐ Multi Family ☒ Existing+ Addition/Alteration Date **10/13/2010**

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	306	0.062	R-19				225	24	New	4.2.2-A6	Addition 2nd Floor
Wall	60	0.102	R-13				180	90	New	4.3.1-A3	Addition 2nd Floor
Wall	82	0.102	R-13				45	90	New	4.3.1-A3	Addition 2nd Floor
Wall	82	0.102	R-13				315	90	New	4.3.1-A3	Addition 2nd Floor
Wall	159	0.102	R-13				270	90	New	4.3.1-A3	Addition 2nd Floor
Wall	69	0.102	R-13				90	90	New	4.3.1-A3	Addition 2nd Floor
Wall	155	0.102	R-13				0	90	New	4.3.1-A3	Addition 2nd Floor
Roof	457	0.079	R-11				30	24	Existing	4.2.1-A2	Existing Second Floor
Wall	145	0.356	None				0	90	Removed	4.3.1-A1	Existing Second Floor
Wall	94	0.356	None				270	90	Removed	4.3.1-A1	Existing Second Floor
Wall	59	0.356	None				0	90	Existing	4.3.1-A1	Existing Second Floor
Wall	184	0.356	None				180	90	Existing	4.3.1-A1	Existing Second Floor
Wall	208	0.356	None				90	90	Existing	4.3.1-A1	Existing Second Floor
Wall	110	0.356	None				270	90	Existing	4.3.1-A1	Existing Second Floor
Floor	1,975	0.097	None				0	180	Existing	4.4.1-A1	Existing First Floor
Roof	310	0.079	R-11				30	24	Removed	4.2.1-A2	Existing First Floor

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹		SHGC ²		Azm	Status	Glazing Type	Location/Comments
1	Skylight	4.0	0.710	Default	0.73	Default	225	New	Double Metal Clear	Addition 2nd Floor
2	Window	4.0	0.550	Default	0.67	Default	180	New	Double Non Metal Clear	Addition 2nd Floor
3	Window	20.0	0.550	Default	0.67	Default	45	New	Double Non Metal Clear	Addition 2nd Floor
4	Window	20.0	0.550	Default	0.67	Default	315	New	Double Non Metal Clear	Addition 2nd Floor
5	Window	7.0	0.550	Default	0.67	Default	270	New	Double Non Metal Clear	Addition 2nd Floor
6	Window	4.0	0.550	Default	0.67	Default	90	New	Double Non Metal Clear	Addition 2nd Floor
7	Window	13.3	0.550	Default	0.67	Default	0	New	Double Non Metal Clear	Addition 2nd Floor
8	Window	36.7	0.550	Default	0.67	Default	180	New	Double Non Metal Clear	Existing Second Floor
9	Window	68.0	0.550	Default	0.67	Default	180	New	Double Non Metal Clear	Existing Second Floor
10	Window	110.1	0.550	Default	0.67	Default	180	Removed	Double Non Metal Clear	Existing Second Floor
11	Window	8.3	0.550	Default	0.67	Default	90	Existing	Double Non Metal Clear	Existing Second Floor
12	Window	4.0	0.550	Default	0.67	Default	270	Removed	Double Non Metal Clear	Existing Second Floor
13	Window	14.0	0.550	Default	0.67	Default	270	Existing	Double Non Metal Clear	Existing Second Floor
14	Skylight	11.0	1.190	Default	0.83	Default	30	Existing	Single Metal Clear	Existing First Floor
15	Window	7.6	0.550	Default	0.67	Default	225	Existing	Double Non Metal Clear	Existing First Floor
16	Window	7.6	0.550	Default	0.67	Default	135	Existing	Double Non Metal Clear	Existing First Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	None	1.00												
15	Bug Screen	0.76												
16	Bug Screen	0.76												

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name **East Manhattan E+A SFR (4.3%) BASE CAS** Building Type ☒ Single Family ☐ Addition Alone
☐ Multi Family ☒ Existing+ Addition/Alteration Date **10/13/2010**

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	1,197	0.079	R-11				30	24	Existing	4.2.1-A2	Existing First Floor
Wall	191	0.356	None				0	90	Existing	4.3.1-A1	Existing First Floor
Door	18	0.500	None				0	90	New	4.5.1-A4	Existing First Floor
Wall	67	0.356	None				225	90	Existing	4.3.1-A1	Existing First Floor
Wall	26	0.356	None				135	90	Existing	4.3.1-A1	Existing First Floor
Wall	26	0.356	None				45	90	Existing	4.3.1-A1	Existing First Floor
Wall	79	0.356	None				315	90	Existing	4.3.1-A1	Existing First Floor
Wall	87	0.356	None				0	90	Existing	4.3.1-A1	Existing First Floor
Wall	216	0.356	None				180	90	Existing	4.3.1-A1	Existing First Floor
Wall	495	0.356	None				90	90	Existing	4.3.1-A1	Existing First Floor
Wall	397	0.356	None				270	90	Existing	4.3.1-A1	Existing First Floor

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
17	Window	7.6	0.550 Default	0.67 Default	45	Existing	Double Non Metal Clear	Existing First Floor
18	Window	20.0	0.550 Default	0.67 Default	315	Existing	Double Non Metal Clear	Existing First Floor
19	Window	7.6	0.550 Default	0.67 Default	315	Existing	Double Non Metal Clear	Existing First Floor
20	Window	24.0	0.550 Default	0.67 Default	0	Existing	Double Non Metal Clear	Existing First Floor
21	Window	136.0	0.550 Default	0.67 Default	180	Existing	Double Non Metal Clear	Existing First Floor
22	Window	28.5	0.550 Default	0.67 Default	180	Existing	Double Non Metal Clear	Existing First Floor
23	Window	37.1	0.550 Default	0.67 Default	90	Existing	Double Non Metal Clear	Existing First Floor
24	Window	50.0	0.550 Default	0.67 Default	270	Existing	Double Non Metal Clear	Existing First Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
17	Bug Screen	0.76												
18	Bug Screen	0.76												
19	Bug Screen	0.76												
20	Bug Screen	0.76												
21	Bug Screen	0.76												
22	Bug Screen	0.76												
23	Bug Screen	0.76												
24	Bug Screen	0.76												

CF-1R

Date

10/13/2010

System Name	Zone Name	Floor Area (ft ²)				Volume	Year Built
		New	Existing	Altered	Removed		
Existing + Addition System	Addition 2nd Floor	310				2,511	
	Existing Second Floor			457		3,702	1956
	Existing First Floor			1,975		15,998	1956
	Totals	310	0	2,432	0		

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
Existing + Addition System	1	Central Furnace	80% AFUE	No Cooling	13.0 SEER	Setback	Existing

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
Existing + Addition System	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	Existing
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

[illegible]

Control			Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
	Qty.	HP		Plenum	Outside	Buried					
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name East Manhattan E+A SFR (4.3%) BASE CASE		Date 10/13/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			
<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-11T19:36:00 ID: 8360P Page 10 of 13 </div>			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name East Manhattan E+A SFR (4.3%) BASE CASE		Date 10/13/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft2 or 100 watts for dwelling units larger than 2,500 ft2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-11T19:36:00 ID: 8360P Page 11 of 13			

Date _____

10/13/2010

\$150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

\$150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. **EXCEPTION 1:** Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-occupant sensor that complies with the applicable requirements of §119. **EXCEPTION 2:** Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

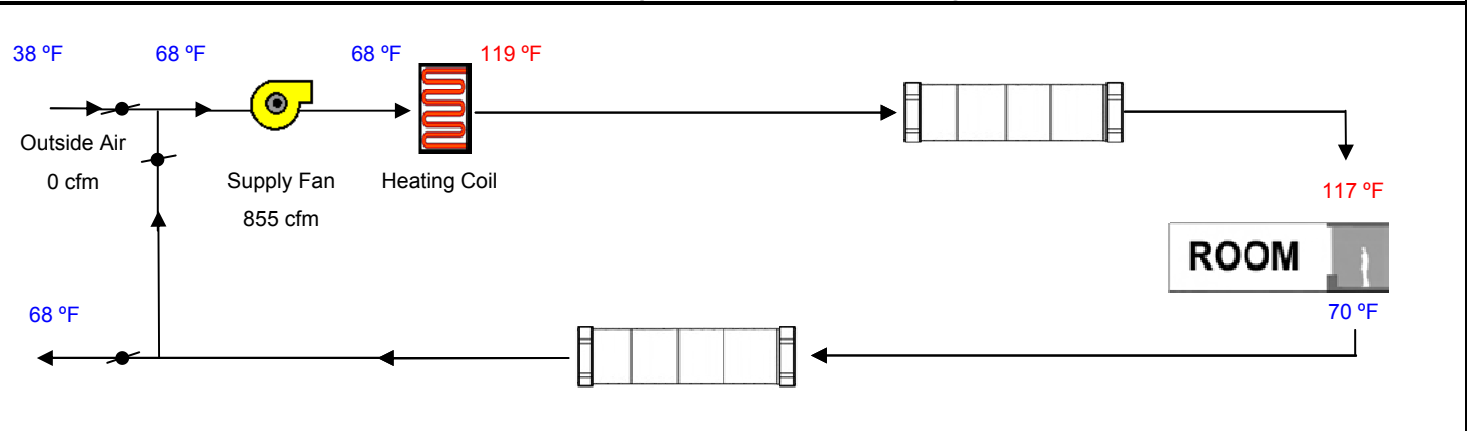
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name East Manhattan E+A SFR (4.3%) BASE CASE	Date 10/13/2010
System Name Existing + Addition System	Floor Area 2,742

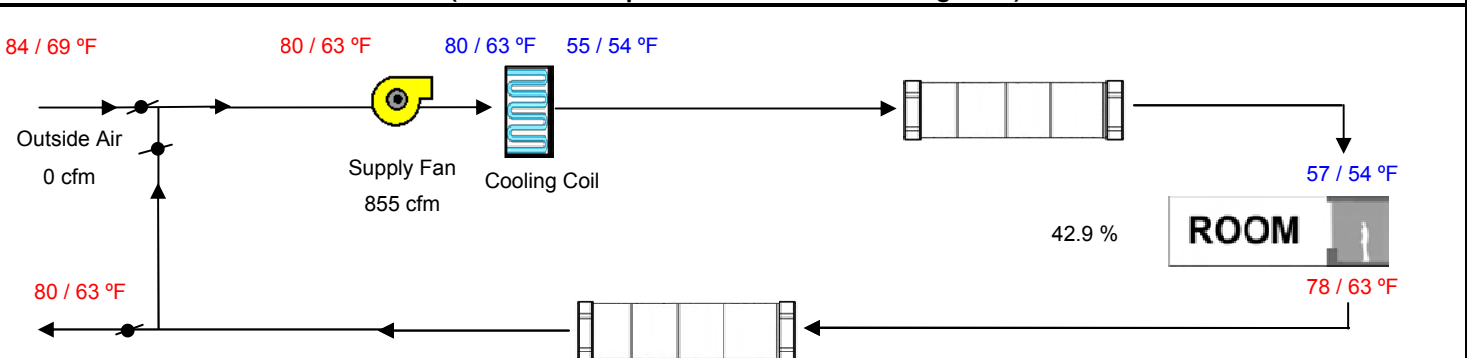
ENGINEERING CHECKS		SYSTEM LOAD					
Number of Systems	1	Total Room Loads Return Vented Lighting Return Air Ducts Return Fan Ventilation Supply Fan Supply Air Ducts TOTAL SYSTEM LOAD	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System			CFM	Sensible	Latent	CFM	Sensible
Output per System	75,000		2,254	51,906	3,267	1,060	53,941
Total Output (Btuh)	75,000			0			
Output (Btuh/sqft)	27.4			2,328			2,622
Cooling System				0			0
Output per System	0		0	0	0	0	0
Total Output (Btuh)	0			0			0
Total Output (Tons)	0.0			2,328			2,622
Total Output (Btuh/sqft)	0.0						
Total Output (sqft/Ton)	0.0			56,562	3,267		59,185

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	855	Existing 80% Furnace Assumed				
Airflow (cfm)	855		0	0		75,000
Airflow (cfm/sqft)	0.31					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output (Adjusted for Peak Design conditions)		0	0	75,000
Outside Air (cfm/sqft)	0.00	TIME OF SYSTEM PEAK				
Note: values above given at ARI conditions					Aug 3 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



BUILDING ENERGY ANALYSIS REPORT

PROJECT:

E. Manhattan E+A SFR (15%) All ECM's
1516 Ruhland Avenue
Manhattan Beach, CA 90266

Project Designer:

Robert Treman Architecture
2100 N. Sepulveda Blvd. #11
Manhattan Beach, CA 90266
(310) 379-8567

Report Prepared by:

Rick Newton
NEWTON ENERGY
1401 19th Street
Manhattan Beach, CA 90266
310 375-2699



Job Number:

8360P

Date:

10/16/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – www.energysoft.com.

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HVAC System Heating and Cooling Loads Summary	13

PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)		CF-1R																																																																																																																																																
Project Name <i>E. Manhattan E+A SFR (15%) All ECM's</i>			Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration				Date <i>10/16/2010</i>																																																																																																																																																	
Project Address <i>1516 Ruhland Avenue Manhattan Beach</i>			California Energy Climate Zone <i>CA Climate Zone 06</i>		Total Cond. Floor Area <i>2,742</i>		Addition <i>310</i>		# of Stories <i>2</i>																																																																																																																																															
FIELD INSPECTION ENERGY CHECKLIST <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.																																																																																																																																																								
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">INSULATION</th> <th>Area</th> <th>Special</th> <th colspan="2"></th> <th colspan="2"></th> <th colspan="2"></th> </tr> <tr> <th>Construction</th> <th>Type</th> <th>Cavity</th> <th>(ft²)</th> <th>Features (see Part 2 of 5)</th> <th colspan="2">Status</th> <th colspan="3"></th> </tr> <tr> <td><i>Roof</i></td> <td><i>Wood Framed Rafter</i></td> <td><i>R-19</i></td> <td><i>306</i></td> <td></td> <td colspan="2"><i>New</i></td> <td colspan="3"></td> </tr> <tr> <td><i>Wall</i></td> <td><i>Wood Framed</i></td> <td><i>R-13</i></td> <td><i>607</i></td> <td></td> <td colspan="2"><i>New</i></td> <td colspan="3"></td> </tr> <tr> <td><i>Roof</i></td> <td><i>Wood Framed Attic</i></td> <td><i>R-30</i></td> <td><i>1,654</i></td> <td></td> <td colspan="2"><i>Altered</i></td> <td colspan="3"></td> </tr> <tr> <td><i>Wall</i></td> <td><i>Wood Framed</i></td> <td><i>None</i></td> <td><i>2,146</i></td> <td></td> <td colspan="2"><i>Existing</i></td> <td colspan="3"></td> </tr> <tr> <td><i>Floor</i></td> <td><i>Wood Framed w/Crawl Space</i></td> <td><i>None</i></td> <td><i>1,975</i></td> <td></td> <td colspan="2"><i>Existing</i></td> <td colspan="3"></td> </tr> <tr> <td><i>Door</i></td> <td><i>Opaque Door</i></td> <td><i>None</i></td> <td><i>18</i></td> <td></td> <td colspan="2"><i>New</i></td> <td colspan="3"></td> </tr> <tr><td colspan="10"> </td></tr> <tr><td colspan="10"> </td></tr> </table>										INSULATION		Area	Special							Construction	Type	Cavity	(ft ²)	Features (see Part 2 of 5)	Status					<i>Roof</i>	<i>Wood Framed Rafter</i>	<i>R-19</i>	<i>306</i>		<i>New</i>					<i>Wall</i>	<i>Wood Framed</i>	<i>R-13</i>	<i>607</i>		<i>New</i>					<i>Roof</i>	<i>Wood Framed Attic</i>	<i>R-30</i>	<i>1,654</i>		<i>Altered</i>					<i>Wall</i>	<i>Wood Framed</i>	<i>None</i>	<i>2,146</i>		<i>Existing</i>					<i>Floor</i>	<i>Wood Framed w/Crawl Space</i>	<i>None</i>	<i>1,975</i>		<i>Existing</i>					<i>Door</i>	<i>Opaque Door</i>	<i>None</i>	<i>18</i>		<i>New</i>																																																																			
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<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:46:56 ID: 8360P Page 3 of 13 </div>																																																																																																																																																								

PERFORMANCE CERTIFICATE: Residential						(Part 1 of 5)		CF-1R																																																																																																																									
Project Name <i>E. Manhattan E+A SFR (15%) All ECM's</i>			Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration				Date <i>10/16/2010</i>																																																																																																																										
Project Address <i>1516 Ruhland Avenue Manhattan Beach</i>			California Energy Climate Zone <i>CA Climate Zone 06</i>		Total Cond. Floor Area <i>2,742</i>		Addition <i>310</i>		# of Stories <i>2</i>																																																																																																																								
FIELD INSPECTION ENERGY CHECKLIST <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Special Features -- If Yes, see Part 2 of 5 of this form for details.																																																																																																																																	
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CF-1R

10/16/2010

The HVAC System Carrier Corp. 58UVB080-20 does not include a cooling system, field verification is not necessary.

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

PERFORMANCE CERTIFICATE: Residential

(Part 3 of 5)

CF-1R

Project Name E. Manhattan E+A SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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ANNUAL ENERGY USE SUMMARY

	Standard	Proposed	Margin
TDV (kBtu/ft ² -yr)			
Space Heating	37.05	27.52	9.53
Space Cooling	16.93	13.55	3.38
Fans	9.26	7.93	1.33
Domestic Hot Water	15.31	15.31	0.00
Pumps	0.00	0.00	0.00
Totals	78.54	64.31	14.23
Percent Better Than Standard:			18.1 %

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

Building Front Orientation:	(N) 0 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	1.00	(N)	683	65
Fuel Available at Site:	Natural Gas	(E)	855	57
Raised Floor Area:	1,975	(S)	807	281
Slab on Grade Area:	0	(W)	946	119
Average Ceiling Height:	8.1	Roof	1,975	15
Fenestration Average U-Factor:	0.55		TOTAL:	536
Average SHGC:	0.67		Fenestration/CFA Ratio:	19.6 %

REMARKS

BASE CASE (6.2%): Assuming existing & new fenestration is Double Non-Metal Clear. Standard Gas 50 gal or Less water heater.

20% CASE:

ECM-9 Attic Insul. Upgrade: Assumed R-19 (E) to R-30: 6.9%;

ECM-5 Replace Existing Furnace: 9.1%;

ECM-7 Skylight Upgrade: 5.9%.

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Company **NEWTON ENERGY**

Address **1401 19th Street**

Name **Rick Newton**

City/State/Zip **Manhattan Beach, CA 90266**

Phone **310 375-2699**



10/16/2010

Signed

Date

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company **Robert Treman Architecture**

Address **2100 N. Sepulveda Blvd. #11**

Name **Robert Treman**

City/State/Zip **Manhattan Beach, CA 90266**

Phone **(310) 379-8567**

Signed

License #

Date

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name E. Manhattan E+A SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	306	0.062	R-19				225	24	New	4.2.2-A6	Addition 2nd Floor
Wall	60	0.102	R-13				180	90	New	4.3.1-A3	Addition 2nd Floor
Wall	82	0.102	R-13				45	90	New	4.3.1-A3	Addition 2nd Floor
Wall	82	0.102	R-13				315	90	New	4.3.1-A3	Addition 2nd Floor
Wall	159	0.102	R-13				270	90	New	4.3.1-A3	Addition 2nd Floor
Wall	69	0.102	R-13				90	90	New	4.3.1-A3	Addition 2nd Floor
Wall	155	0.102	R-13				0	90	New	4.3.1-A3	Addition 2nd Floor
Roof	457	0.032	R-30				30	24	Altered	4.2.1-A8 (E=4.2.1-A2)	Existing Second Floor
Wall	145	0.356	None				0	90	Removed	4.3.1-A1	Existing Second Floor
Wall	94	0.356	None				270	90	Removed	4.3.1-A1	Existing Second Floor
Wall	59	0.356	None				0	90	Existing	4.3.1-A1	Existing Second Floor
Wall	184	0.356	None				180	90	Existing	4.3.1-A1	Existing Second Floor
Wall	208	0.356	None				90	90	Existing	4.3.1-A1	Existing Second Floor
Wall	110	0.356	None				270	90	Existing	4.3.1-A1	Existing Second Floor
Floor	1,975	0.097	None				0	180	Existing	4.4.1-A1	Existing First Floor
Roof	1,197	0.032	R-30				30	24	Altered	4.2.1-A8 (E=4.2.1-A2)	Existing First Floor

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
1	Skylight	4.0	0.710 Default	0.73 Default	225	New	Double Metal Clear	Addition 2nd Floor
2	Window	4.0	0.550 Default	0.67 Default	180	New	Double Non Metal Clear	Addition 2nd Floor
3	Window	20.0	0.550 Default	0.67 Default	45	New	Double Non Metal Clear	Addition 2nd Floor
4	Window	20.0	0.550 Default	0.67 Default	315	New	Double Non Metal Clear	Addition 2nd Floor
5	Window	7.0	0.550 Default	0.67 Default	270	New	Double Non Metal Clear	Addition 2nd Floor
6	Window	4.0	0.550 Default	0.67 Default	90	New	Double Non Metal Clear	Addition 2nd Floor
7	Window	13.3	0.550 Default	0.67 Default	0	New	Double Non Metal Clear	Addition 2nd Floor
8	Window	36.7	0.550 Default	0.67 Default	180	New	Double Non Metal Clear	Existing Second Floor
9	Window	68.0	0.550 Default	0.67 Default	180	New	Double Non Metal Clear	Existing Second Floor
10	Window	110.1	0.550 Default	0.67 Default	180	Removed	Double Non Metal Clear	Existing Second Floor
11	Window	8.3	0.550 Default	0.67 Default	90	Existing	Double Non Metal Clear	Existing Second Floor
12	Window	4.0	0.550 Default	0.67 Default	270	Removed	Double Non Metal Clear	Existing Second Floor
13	Window	14.0	0.550 Default	0.67 Default	270	Existing	Double Non Metal Clear	Existing Second Floor
14	Skylight	11.0	0.390 NFRC	0.29 NFRC	30	Altered	Velux Comfort+(74) Lowe2/Arg	Existing First Floor
15	Existing		1.190 Default	0.83 Default			Single Metal Clear	pre-altered for above
16	Window	7.6	0.550 Default	0.67 Default	225	Existing	Double Non Metal Clear	Existing First Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	None	1.00												
15	None	1.00												
16	Bug Screen	0.76												

CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name E. Manhattan E+A SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	310	0.079	R-11				30	24	Removed	4.2.1-A2	Existing First Floor
Wall	191	0.356	None				0	90	Existing	4.3.1-A1	Existing First Floor
Door	18	0.500	None				0	90	New	4.5.1-A4	Existing First Floor
Wall	67	0.356	None				225	90	Existing	4.3.1-A1	Existing First Floor
Wall	26	0.356	None				135	90	Existing	4.3.1-A1	Existing First Floor
Wall	26	0.356	None				45	90	Existing	4.3.1-A1	Existing First Floor
Wall	79	0.356	None				315	90	Existing	4.3.1-A1	Existing First Floor
Wall	87	0.356	None				0	90	Existing	4.3.1-A1	Existing First Floor
Wall	216	0.356	None				180	90	Existing	4.3.1-A1	Existing First Floor
Wall	495	0.356	None				90	90	Existing	4.3.1-A1	Existing First Floor
Wall	397	0.356	None				270	90	Existing	4.3.1-A1	Existing First Floor

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor ¹	SHGC ²	Azm	Status	Glazing Type	Location/Comments
17	Window	7.6	0.550 Default	0.67 Default	135	Existing	Double Non Metal Clear	Existing First Floor
18	Window	7.6	0.550 Default	0.67 Default	45	Existing	Double Non Metal Clear	Existing First Floor
19	Window	20.0	0.550 Default	0.67 Default	315	Existing	Double Non Metal Clear	Existing First Floor
20	Window	7.6	0.550 Default	0.67 Default	315	Existing	Double Non Metal Clear	Existing First Floor
21	Window	24.0	0.550 Default	0.67 Default	0	Existing	Double Non Metal Clear	Existing First Floor
22	Window	136.0	0.550 Default	0.67 Default	180	Existing	Double Non Metal Clear	Existing First Floor
23	Window	28.5	0.550 Default	0.67 Default	180	Existing	Double Non Metal Clear	Existing First Floor
24	Window	37.1	0.550 Default	0.67 Default	90	Existing	Double Non Metal Clear	Existing First Floor
25	Window	50.0	0.550 Default	0.67 Default	270	Existing	Double Non Metal Clear	Existing First Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value

(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
17	Bug Screen	0.76												
18	Bug Screen	0.76												
19	Bug Screen	0.76												
20	Bug Screen	0.76												
21	Bug Screen	0.76												
22	Bug Screen	0.76												
23	Bug Screen	0.76												
24	Bug Screen	0.76												
25	Bug Screen	0.76												

CERTIFICATE OF COMPLIANCE: Residential **(Part 5 of 5)** **CF-1R**

Project Name E. Manhattan E+A SFR (15%) All ECM's	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
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BUILDING ZONE INFORMATION							
System Name	Zone Name	Floor Area (ft ²)				Volume	Year Built
		New	Existing	Altered	Removed		
NEW Existing + Addition System	Addition 2nd Floor	310				2,511	
	Existing Second Floor			457		3,702	1956
	Existing First Floor			1,975		15,998	1956
Totals		310	0	2,432	0		

HVAC SYSTEMS							
System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
NEW Existing + Addition System	1	Central Furnace	95% AFUE	No Cooling	13.0 SEER	Setback	Altered
pre-altered for above		Central Furnace	80% AFUE	No Cooling	13.0 SEER	Setback	

HVAC DISTRIBUTION						
System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
NEW Existing + Addition System	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	<input type="checkbox"/>	Altered
pre-altered for above	Ducted	Ducted	Attic, Ceiling Ins, vented	2.1	<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

WATER HEATING SYSTEMS									
System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
Standard Gas 50 gal or Less	1	Small Gas	Kitchen Pipe Ins	40,000	50	0.53	n/a	n/a	Existing

MULTI-FAMILY WATER HEATING DETAILS								HYDRONIC HEATING SYSTEM PIPING			
Control			Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
	Qty.	HP		Plenum	Outside	Buried					
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

MANDATORY MEASURES SUMMARY: Residential		(Page 1 of 3)	MF-1R
Project Name E. Manhattan E+A SFR (15%) All ECM's		Date 10/16/2010	
<p>NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.</p>			
Building Envelope Measures:			
§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.			
§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).			
§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.			
§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.			
§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.			
*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.			
§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.			
*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.			
*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.			
§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.			
§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.			
§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.			
Fireplaces, Decorative Gas Appliances and Gas Log Measures:			
§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.			
§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.			
§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.			
Space Conditioning, Water Heating and Plumbing System Measures:			
§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.			
§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.			
§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.			
§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.			
§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).			
§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.			
§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.			
§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.			
§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.			
§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.			
§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.			
§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.			
§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.			
<div style="display: flex; justify-content: space-between; font-size: small;"> EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:46:56 ID: 8360P Page 10 of 13 </div>			

MANDATORY MEASURES SUMMARY: Residential		(Page 2 of 3)	MF-1R
Project Name E. Manhattan E+A SFR (15%) All ECM's		Date 10/16/2010	
§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used			
§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.			
§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.			
§150(m)7: Exhaust fan systems have back draft or automatic dampers.			
§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.			
§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.			
§150(m)10: Flexible ducts cannot have porous inner cores.			
§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.			
Pool and Spa Heating Systems and Equipment Measures:			
§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.			
§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.			
§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.			
§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.			
§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).			
Residential Lighting Measures:			
§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.			
§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).			
§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.			
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.			
§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).			
§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.			
§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft ² or 100 watts for dwelling units larger than 2,500 ft ² may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.			
§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.			
EnergyPro 5.1 by EnergySoft User Number: 2100 RunCode: 2010-10-16T18:46:56 ID: 8360P Page 11 of 13			

MANDATORY MEASURES SUMMARY: Residential		(Page 3 of 3)	MF-1R
Project Name <i>E. Manhattan E+A SFR (15%) All ECM's</i>		Date <i>10/16/2010</i>	
<p>§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119. EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.</p>			
<p>§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminares. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.</p>			
<p>§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.</p>			
<p>§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on. EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.</p>			
<p>§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).</p>			
<p>§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.</p>			
<p>§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.</p>			

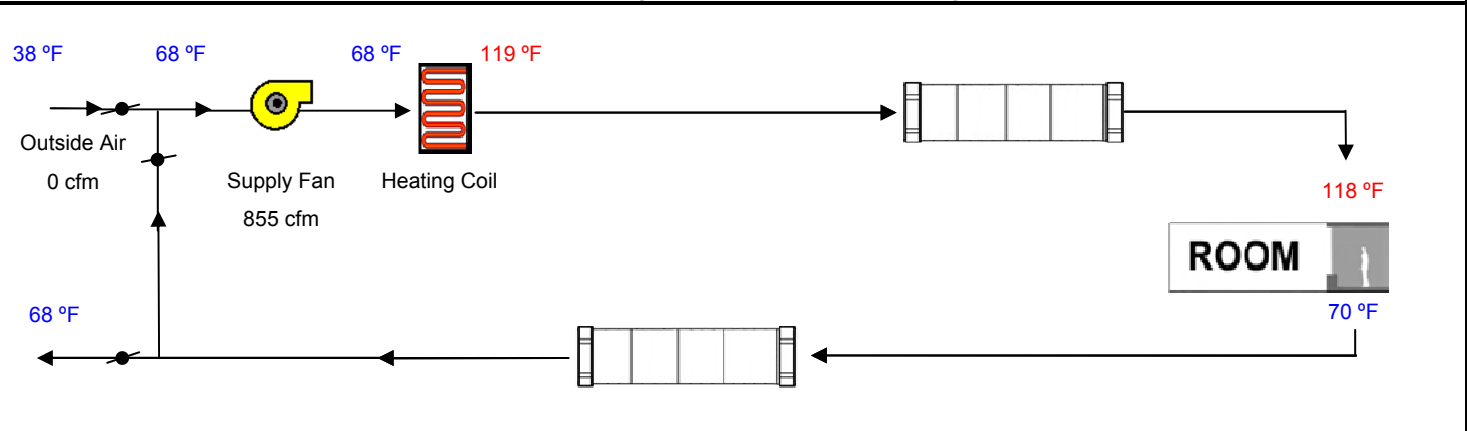
HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name E. Manhattan E+A SFR (15%) All ECM's	Date 10/16/2010
System Name NEW Existing + Addition System	Floor Area 2,742

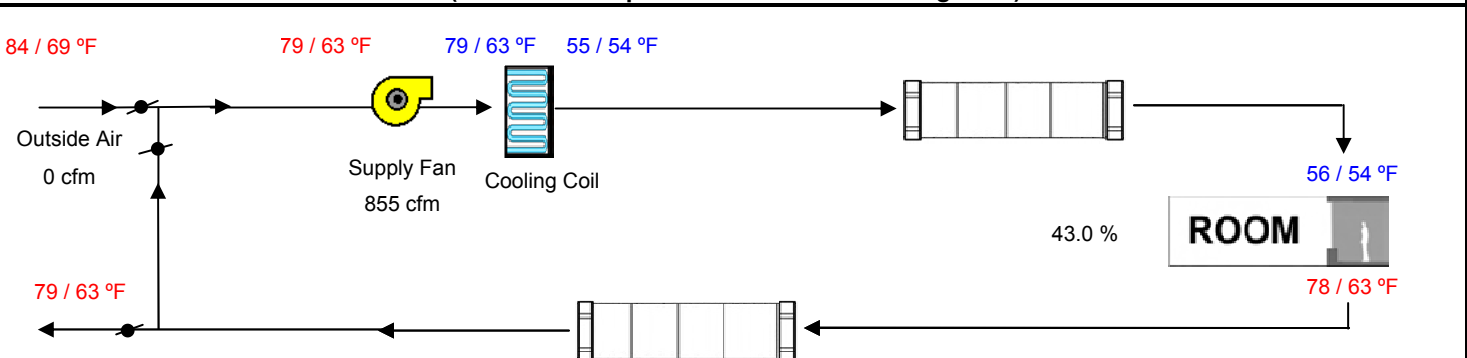
ENGINEERING CHECKS		SYSTEM LOAD				
Number of Systems	1	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System		CFM	Sensible	Latent	CFM	Sensible
Output per System	75,000	2,052	47,563	3,267	1,002	51,172
Total Output (Btuh)	75,000		0			
Output (Btuh/sqft)	27.4		2,133			2,487
			0			0
Cooling System						
Output per System	0	0	0	0	0	0
Total Output (Btuh)	0		0			0
Total Output (Tons)	0.0		2,133			2,487
Total Output (Btuh/sqft)	0.0					
Total Output (sqft/Ton)	0.0	TOTAL SYSTEM LOAD				
			51,829	3,267		56,147

Air System		HVAC EQUIPMENT SELECTION				
CFM per System	855	Carrier Corp. 58UVB080-20				75,000
Airflow (cfm)	855		0	0		
Airflow (cfm/sqft)	0.31					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	Total Adjusted System Output (Adjusted for Peak Design conditions)				75,000
Outside Air (cfm/sqft)	0.00		0	0		
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK			Aug 3 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



LIFE CYCLE COSTING SUMMARY

LCC-1

Project Name

LCC for E. Manhattan E+A SFR to 15% - 20 year

Date

10/19/2010

ANNUAL ENERGY USE AND COST

Option	Description	Electricity			Natural Gas		Simple Payback (years)
		Consumption (kWh)	Demand (kW)	Cost (\$)	Consumption (therms)	Cost (\$)	
Base	East Manhattan E+A SFR BASE CASE	3,598	12	\$1,020	857	\$945	N/A
1	ECM-5 Replace Existing Furnace: 9.1%	3,598	12	\$1,020	793	\$872	22.0
2	ECM-7 Skylight Upgrade: 5.9%	3,496	12	\$997	854	\$943	17.5
3	ECM-9 Attic Insul. Upgrade: (E) to R-30: 6.9%	3,373	11	\$969	856	\$945	31.1
4	TOTAL: 15% CASE - All ECM's: 20.7%	3,283	11	\$949	726	\$796	16.6

LIFE CYCLE COST PRESENT VALUE

Option	Initial Cost	Utility Incentive	Annual Recurring Costs	Electricity Costs	Natural Gas Costs	Non Annual Recurring OM&R Cost	Replacem. Costs	Residual Value	Total LCC	Savings
Base	\$0	\$0	\$0	\$15,125	\$16,571	\$0	\$0	\$0	\$31,696	\$0
1	\$1,600	\$0	\$0	\$15,125	\$15,293	\$0	\$0	\$0	\$32,019	(\$323)
2	\$450	\$0	\$0	\$14,783	\$16,526	\$0	\$0	\$0	\$31,759	(\$62)
3	\$1,600	\$0	\$0	\$14,368	\$16,563	\$0	\$0	\$0	\$32,532	(\$835)
4	\$3,650	\$0	\$0	\$14,069	\$13,958	\$0	\$0	\$0	\$31,677	\$19

Study Parameters

Study Period: 20 years

Real Discount Rate: 3.0 %

☒ DOE/FEMP Escalation Rates

Region: Western US

Fuel Sector: Commercial

☐ Uniform Escalation Rates

Electricity: N/A

Natural Gas: N/A

LIFE CYCLE COST SAVINGS

